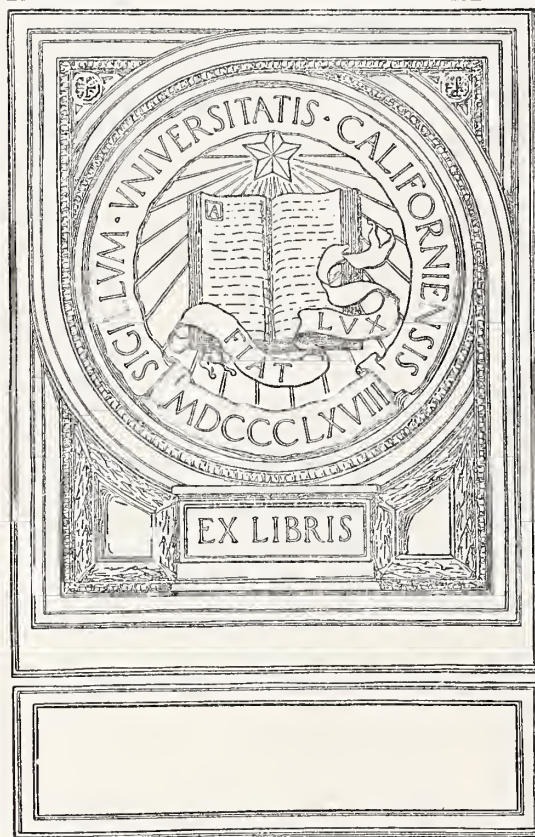
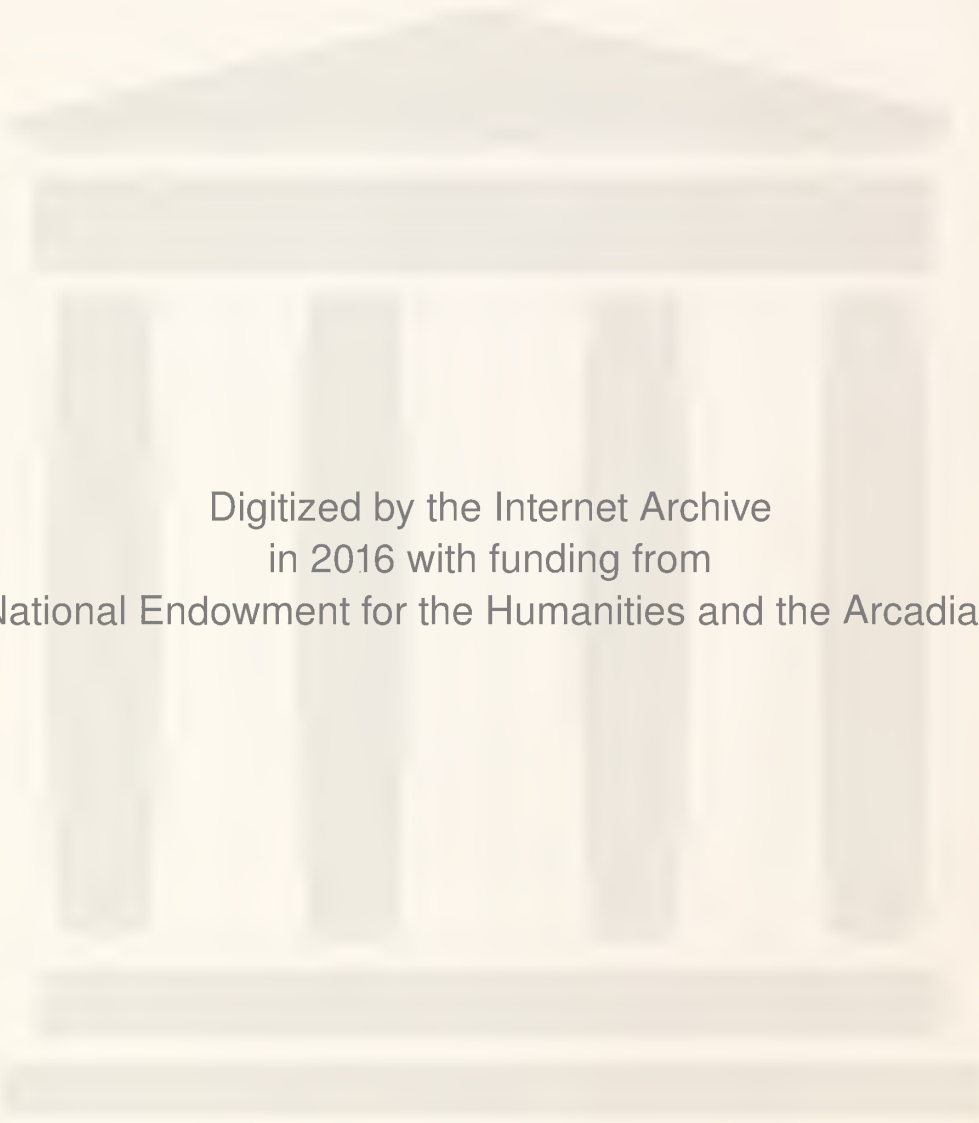


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Original Contributions

A Follow-up of Children Discharged from a Psychiatric Ward

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Minneapolis, Minnesota

RESEARCH on the effects and outcome of psychiatric treatment* has been limited, and much of what has been done lacks scope, clarity, and quality. Miles et al.¹ reported a critical review of thirty-five studies dealing with the outcome of psychiatric treatments in 1950. They noted that these studies did not state their criteria for judging improvement clearly, if at all; they were generally not comparable; and their mean results tended to approximate the spontaneous recovery rate of neurotic patients from mental hospitals.

When the area of concern is narrowed to the outcome of psychiatric treatment of child patients, the literature is even more meager. Witmer² in an early study concluded that the parents' emotional adjustment is the most important variable for recovery. Her paper is important in that she tried to establish explicit criteria for basing judgments of improvement. Hardcastle³ reported a follow-up study in which 64 per cent of the children were improved. Benjamin and Weatherly⁴ reported on follow-up studies done by Camper⁵ and Gordon⁶ on the first forty-eight patients discharged from the Children's Ward of the Illinois Neuropsychiatric Institute. Using a relative criteria of change, they found one-fourth greatly improved after a period of from two to five years after discharge. One-fifth showed no improvement, while 46 per cent showed either slight or moderate improvement. This was after an average stay of 9.3 months in hospital. Gordon found no relationship between categories of background and pre-ward environment and the current adjustment of the children. Thus, major emphasis was placed on the treatment as the main

determiner of outcome. Camper found an optimum stay of seven to nine months on the ward; a maximum number of individual treatment hours with both child and his parents; and the degree of change of the parents' attitudes to be correlated positively with the children's adjustment.

Cohen and Carper⁷ conducted a survey of 2,419 cases seen by the traveling clinics of the New York State Department of Mental Hygiene Child Guidance Clinics during 1938 and 1939. Although these were outpatients, as contrasted to inpatients in the present study, this work is of special interest because these clinics were largely limited to diagnosis and disposition at that time, thus functioning much like our inpatient service at Minnesota. Of the 1,859 cases successfully followed, 44.3 per cent were considered adjusted, 8 per cent much improved, 27.3 per cent improved, and 20.4 per cent unimproved. They found favorable prognoses tended to be associated with diagnosis of speech, social, primary behavior, and educational problems. Poor prognoses tended to be the rule for psychopathic personalities and mental defectives.

The present investigation was undertaken primarily to provide information which our staff could use in evaluating our first years of operation as an inpatient service. We hoped to get rough estimates of the changes which had taken place in the children studied and planned for on the Child Psychiatry Station at the University of Minnesota Hospitals. A basic interest was to provide the parents of our patients an opportunity to criticize the procedures of the services and to offer suggestions for improvements. Only minor attention was accorded the problem of which factors were responsible for the changes in the children in this preliminary and unbudgeted study.

As was true of the studies reviewed, no attempt was made to provide for a control group. A controlled design would give information on the

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*Treatment is used here in a broad sense to include those psychiatric services which function mainly to diagnose and formulate treatment plans which are largely carried out by other physicians, agencies, or persons as well as those offering a more direct therapy.

spontaneous recovery rate and the efficacy of our psychiatric procedures above and beyond the natural curative powers inherent in developing children and their environs.**

Description of the Child Psychiatry Ward and its Operation

The Child Psychiatry Station, opened in October, 1952, occupies one wing of the sixth floor of the University of Minnesota Hospitals. It is a closed ward with single and double rooms to accommodate a total of fourteen boys and girls under the age of sixteen. The station also includes two recreational rooms and lounges, an arts and crafts workshop, a small kitchen, a nurses' station, and the associated service rooms.† The permanent staff includes three physicians, two psychologists, one psychiatric social worker, a public school teacher, an occupational therapist, a teaching assistant, nurses, aides, and orderlies. There are usually two resident physicians on the service (one from pediatrics and one from psychiatry).

Administratively Child Psychiatry is a division of the Department of Pediatrics, but works closely with the Department of Psychiatry with the senior staff holding joint appointments to both departments. The station and its operation is an integral part of the medical school program and student physicians, as well as resident physicians, are assigned to all patients.

Up to this time the service has functioned mainly as a diagnostic study center for the state of Minnesota. As a rule, children are admitted for approximately one month, during which time a thorough study is done following which a treatment plan is formulated and implemented. Many of the patients are followed on an outpatient basis subsequent to their discharge from the hospital; however, many are referred to other clinics or agencies or to their local physician for continued treatment. A few selected children have been maintained on the station for three to six months of inpatient treatment.

**See: Rosenthal, D. and Frank, J. D.: Psychotherapy and the placebo effect. *Psych. Bull.*, 294-302, 1956, for references on experimental designs in evaluating psychotherapy.

†Starting in August, 1956, the Child Psychiatry Station will be remodeled and expanded to provide for a total capacity of twenty-two patients. It will include a new nurses' station with visual control through safety glass enclosures, a new dining room and quiet lounge, a new school room, a greatly expanded and well equipped arts and crafts workshop, an outdoor play area, and new offices, laundry and kitchen facilities.

TABLE I.

Class	Age	Male	Female	Totals	
Major Group					
IQ Range 42-137	2-0 thru 6-11	13	2	15	161
Mean IQ 95.9	7-0 thru 10-11	40	12	52	
S.D. IQ 16.0	11-0 thru 15-11	55	39	94	
Mental Defectives					
IQ Range 25-79	2-0 thru 6-11	6	8	14	36
Mean IQ 50.9	7-0 thru 10-11	6	6	12	
S.D. IQ 11.9	11-0 thru 15-11	6	4	10	
Total		126	71	197	

The psychiatric unit tends to serve as a last resort for the problem children of the state, with many referrals coming from physicians or clinics that regard inpatient psychiatric study and the consulting services essential to handle particular problem children. For this reason our population may differ from the community child guidance clinic in that more children with serious mental and emotional disturbances and organic diseases of the central nervous system are studied.

The Follow-Up Study

Arbitrarily, it was decided to obtain information pertaining to present adjustment on the first two hundred children studied and discharged from the service. The post-discharge period ranged from six to twenty-seven months with a mean of approximately seventeen months. Of the two hundred patients one was deceased and the whereabouts of two was unknown, so that the working sample was 197 children. Table I gives the grouped data on sex, age and intelligence. As noted in the table, the sample was broken into two groups: (1) the major group of behavioral problems, and (2) the severe mental defectives.

Although not typical of studies reviewed, this dichotomy was made in recognition of our sizable group of mental defectives and the relative unmodifiability of their basic problem—low intelligence. As noted below, 5.6 per cent of the major group received formal diagnoses of mental deficiency. These were cases of mild retardation with behavior problems prominent in their presenting complaints, as compared to complaints of inability to learn or school failure for those cases included in the defective group.

The diagnoses of the major group included: organic brain damage (12.4 per cent), psychosis (5.0 per cent), psychoneurosis (9.3 per cent), psychophysiologic reaction (3.7 per cent), personality disorder (21.1 per cent), speech disorder (0.6 per cent), mental deficiency, mild (5.6 per cent), transient situational personality disorder

(39.8 per cent), and no disease or diagnosis deferred (2.5 per cent). Presenting complaints ran the gamut of usual complaints and "admission tickets." All socio-economic classes were represented, but there was an overweighting of lower middle class and lower class families in this group. Sixty-five children came from broken homes; ninety-six came from more or less normal and intact homes. These patients had 2.8 siblings on the average. Of this group, 115, or 71.4 per cent, had negative physical examinations, twenty-six, or 16.1 per cent, had positive neurologic findings. The remainder had a variety of physical or sensory defects. Electroencephalograms were normal or near normal for ninety-nine, or 70.3 per cent, abnormal for forty-two, or 29.7 per cent. Twenty children did not have EEG's reported. The mean length of hospitalization for the group was 27.3 days.

The presenting complaints of the mental defective group ranged from "slow to learn" through "speech difficulty" to "behavior problem," and included a few with physical complaints. All socio-economic classes were represented with a slight overweighting of the upper middle class families. Five of these children came from broken homes, while the rest came from more or less normal homes. There was a mean of 2.7 siblings per patient, and their mean length of hospitalization was 13.8 days.

All of the information gathered on the follow-up was obtained by questionnaire. The questionnaire for the major group asked for the child's present living status; at home, boarding school, foster home, state institution, et cetera. If the child was not living at home, a new questionnaire was mailed to the responsible adult. The first section of this questionnaire asked the parent or surrogate to rate the child on six, five-point rating scales. The scales were: (a) How has he changed since he left the hospital?, (b) How does he get along with the family?, (c) How does he do in his studies at school?, (d) How is his behavior in school?, (e) How does he get along with other children?, and (f) How does he feel about himself? All rating scales allowed one position for worse, one for the same, and three for various degrees of improvement. The raters were asked to base their ratings on the child's behavior for the past two months as compared with when they brought him to the hospital. The second section of this instrument asked: (a) What do you think caused any changes for the better, if present?, (b) Have you consulted any

other physicians or agencies about the same problem since the hospitalization?, and (c) What improvements can we make to render maximum service to the children and their families? The last was composed of a check list and space for suggestions.

A shorter form of the questionnaire, which omitted the ratings of present adjustment, was mailed to the parents of the thirty-six children diagnosed seriously mentally defective. This form included a question about the child's school attendance and one designed to elicit information about what action the parents had taken in their retarded child's behalf.

The questionnaires were mailed out to the patients' parents or parent surrogate with a covering letter which was personalized to include the child's first name and the dates he was hospitalized. This letter was designed to indicate interest in the long range adjustment of the children brought to the hospital and in improving the services to parents of children with similar problems. Each individually typed letter was signed by the chief psychiatrist and the senior psychologist. A special form of the cover letter was drawn up and sent to agencies furnishing the ratings in place of parents. We found Nixon's article⁸ helpful in designing the questionnaire and the cover letter.

For those who did not respond to the first letter, a second and eventually a third form of the cover letter was sent with additional copies of the questionnaire.

Results

One hundred seventy-seven of the 197 questionnaires mailed were returned—an 89.9 per cent rate of return. Four of these were not usable, so the total per cent of usable returns was 87.6 per cent. The first mailing brought approximately 50 per cent returns, the second mailing about 30 per cent, with another 10 per cent following the third request.

Questionnaires for Major Group.—Two distributions of ratings of present adjustment were made. The first was based on ratings on the single item: How has he changed since he was seen at the hospital? The second distribution of adjustment ratings was based on a score derived by summing the weighted ratings for all six adjustment scales. The arbitrary weights assigned were: —1 for worse, 0 for the same, 1 for slight improvement, 2 for marked improvement, and 3 for

TABLE II.

Weighted Adjustment Rating	Male	Female	Total	Per Cent of Total*	
No return or rating not made	18	7	25	15.5	15.5 unknown
-1	4	1	5	3.1	13.7 same or worse
0	14	3	17	10.6	
1	26	16	42	26.1	26.1 slight improvement
2	34	16	50	31.1	44.7 marked improvement
3	12	10	22	13.6	
	108	53	161	100.0	

*These percentages are based on the total sample.

completely over his problem in the area being rated. See Tables II and III for these distributions.

Based on Table II, we find 13.7 per cent of the cases are the same or worse, 26.1 per cent show slight improvement, 44.7 per cent are markedly improved or completely over their problems, and 15.5 per cent are unknown. If the percentages are based on the summated adjustment index, one finds 19.9 per cent the same or worse, 31.1 per cent with slight improvement, and 36.6 per cent markedly improved or having no problems, and 12.4 per cent unknown. It would have been most desirable and interesting to have a matched control group of undiagnosed and untreated problem children against which to compare these percentages of improvement.

An attempt was made to develop a simple prognostic index[‡] based on ratings of the child's symptoms and behavior while in the hospital, as these ratings could be made from material recorded in the regular hospital and psychiatric charts.* The index consisted of five, three-point rating scales covering: (1) malignancy of symptoms, (2) trend of disorder while in the hospital, (3) duration of symptoms, (4) interpersonal relationship with physician, and (5) adjustment to the ward. The positions of the rating scales were arbitrarily weighted equally and added to give a single index. Ratings were made for the entire group of 161 psychiatric cases by one of us. A random sample of twenty-eight cases was rated independently by two of the other authors and reli-

[‡]This index was an adaptation of one worked out by F. D. Thorne: *Principles of Psychological Examining*. J. Clin. Psychol., Brandon, Vermont, 1955, pp. 106-109.

*A tangential concern in this study was to evaluate the potential of the hospital and child psychiatry charts for research purposes. This study clearly indicates the need for modifications to enhance such an objective.

TABLE III.

Weighted Adjustment Indices	Frequency	Per Cent*	
No return or ratings not made	20	12.4	12.4 unknown
-6 thru -1	5	3.1	19.9 same or worse
0 thru 5	27	16.8	
6 thru 11	50	31.1	31.1 slight improvement
12 thru 17	52	32.3	36.6 marked improvement or well
18	7	4.3	
	161	100.0	

*Percentages are based on total sample.

**In a small number of cases, the parent or surrogate had not rated every scale. If at least four of the six scales were rated, the others were prorated in the usual way, with the realization that this may have resulted in an overestimate of adjustment in these cases.

bility coefficients were computed. The corrected Pearson coefficients were .66, .58, and .58, indicating that the inter-rater reliability was not satisfactory. However, the correlations with the adjustment ratings were computed. The Pearson coefficient between the prognostic index and the single rating of adjustment was not significantly different from zero, while the coefficient between the prognostic index and the summated adjustment index was $.30 \pm .08$. Although a low positive relationship exists, it appears that the present prognostic index would not be economical in predicting the later adjustment of our cases.

In a further attempt to locate those variables which might have value for predicting later adjustment, chi squares were computed between the main variables dealt with in this study and the two adjustment indices. Those included were: age, sex, presenting complaint, home status, number of siblings, physical condition, intelligence, socio-economic status, EEG findings, length of stay, diagnosis, and present living placement. The chi square tests for five of these variables were significant at the 5 per cent level or better. These were: presenting complaint, socio-economic status, intelligence, EEG findings, and present living placement. All resulted in low positive contingency coefficients which ranged between .2 and .3. These positive associations were all in the expected direction; that is, lack of presenting physical complaints, high socio-economic status, high intelligence, normal EEG, and living at home all tended to be associated with good future adjustment. Obviously, these variables are not independent and may find common ground in one or two higher order variables.

The Mental Defective Group.—The major interest in following-up the mental defectives was to

find out how many parents had taken action on our recommendations. As in the major group, we were also interested in the parents' reactions to and suggestions for the improvement of our services.

The results show that twenty-three of these children were still living in their own homes, five had been placed in state institutions, three in private institutions and the whereabouts of five was not established. Of the twenty-three living in their own homes, four were on the waiting list for admission to a state school, two were in the process of applying for state guardianship, two were on the waiting list for private institutional care. Nine families were planning to keep their children at home and six did not return or respond to this item. A plan of applying for state guardianship as a type of insurance for the retarded child, and then leaving the exact time of placement up to the parent was presented to most of this group. The results indicate moderate success was obtained in getting parents to follow the recommendations made.

The Parents' Criticisms and Suggestions.—Generally, the respondents took the opportunity of expressing their feelings and ideas about the service. Of the 177 questionnaires returned, 166 filled in this section. Ninety-nine of the respondents were motivated to write comments in addition to filling out the questionnaire. A few of these notes expressed annoyance with our persistence requesting the return of the questionnaires. Some included critical remarks about the service or the diagnosis offered. However, the large majority offered helpful suggestions.

To the question: "If you think your child has improved since he was at the hospital, what do you believe caused the improvement?", fifty-six indicated the help received at the hospital, thirty-nine believed help received from other people outside the hospital, and twenty-one felt that the child just grew out of his problems and would have regardless of the hospitalization.** The next item asked: "Have you consulted any other doctors, hospitals or clinics about your child concerning the problem for which he was seen at the University Hospitals?" Thirty-nine said, "yes," and ninety, "no," indicating that slightly more than a quarter of the respondents felt the need for an-

other opinion or more help. Better communication and rapport with the patients' parents might have reduced this "medical shopping." The last item requested the respondents to check one or more of four statements about how to improve the services rendered by the child psychiatry unit. Nineteen wished more information about what hospitalization would involve prior to admission, twenty-five indicated their need for more time with the physician, sixty-one desired more detailed explanation of the tests and studies done, and fifty-seven asked for more specific recommendations for the planning and management of the child. It seems clear that a considerable proportion felt that the service can improve its techniques in communicating the results of work done in the hospital and in offering, when possible, more specific help to the parents in managing their problem children.† The last part of this item was open-ended and solicited suggestions as to the improvement of the service. An informal tally of their suggestions generally support and reinforce the impression gained from the structured part of this item listed above.

Discussion

One of the most noteworthy aspects of the present investigation is the excellent percentage of returns and the fine interest and co-operation shown by the respondents to our questionnaire. It is felt that personalizing the cover letter, being persistent about having the questionnaires returned, and following a few simple rules of questionnaire design paid dividends.

Our findings cannot be compared exactly with any of the previous studies reported because of differences in the sample, the methods of obtaining the follow-up data, and the lengths of time since discharge or treatment. However, our results of roughly 17 per cent the same or worse, 68 per cent showing some degree of improvement, and 15 per cent unknown appear encouraging. This seems especially so when the type of population and the shortness of the hospitalization are considered. The staff has a tendency to echo the sentiments of Cohen and Carper:³

"The adjustment results shown by the present survey substantiates rather well what the clinic personnel have

**These figures are based on the 145 questionnaires returned by the major group.

†This criticism may justifiably be questioned in that some parents did not understand, accept, or remember the counsel and help offered them. However, this fact is considered a challenge for the development of better techniques.

long maintained, namely, that decidedly favorable results are obtained from the type of clinic service provided, despite its drawbacks. This is not to say, however, that the program has been entirely satisfactory. On the contrary, the clinic personnel is in full agreement that better results would have been obtained with more intensive treatment."

The attempt at developing a crude prognostic index failed. The unreliability of the ratings on adjustment made by the parents and of the child's traits as noted by the hospital staff may have attenuated any relationship which does exist between these variables.

The parents' suggestions were most helpful in stimulating the staff to review its methods and procedures and in providing a nucleus of ideas for improving the total service.

Summary

1. A questionnaire follow-up was made on the first two hundred children discharged from the inpatient service of the University of Minnesota Child Psychiatry Station.

2. The rate of questionnaire returns was high (90 per cent). The results indicate approximately 17 per cent the same or worse, 28 per cent slightly improved, 40 per cent markedly improved or well, and 15 per cent unknown.

3. Suggestions from parents indicate their need for more detailed information about their child and more specific help in planning management. Suggested also was their desire for a follow-up contact which would help them to make optimal use of the hospital experience.

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A research training program to increase scientific manpower for clinical and non-clinical cancer research has been established by the National Cancer Institute of the Public Health Service, Department of Health, Education, and Welfare. Funds totaling \$1,200,000 were appropriated for the program by Congress.

Surgeon General Leroy E. Burney has approved 15 research training grants, totaling \$819,067 to 14 institutions whose applications were recommended by the National Advisory Cancer Council.

The program extends and supplements but does not replace the research training opportunities available through regular research fellowships and through employment on research projects. Under this program the institutions receiving funds select and appoint the individuals to be trained and determine the stipends they are to be paid.

Slightly more than half of the total appropriation of \$1,200,000 was earmarked by Congress especially for training in fields of chemotherapy and steroid hormones. The research fields represented among the 15 grants

are: cancer chemotherapy, steroid biochemistry, research medicine, pharmacology, biochemistry, immunology, research surgery, histochemistry, electron microscopy, genetics, cytology, radiobiology, and cancer biology.

The following grants for training in chemotherapy and steroid hormones were announced: University of Utah, \$74,145; Clark University, \$97,761; Columbia University, \$52,812; Yale University, \$37,800; Sloan-Kettering Institute for Cancer Research, \$100,000; Roswell Park Memorial Institute, \$32,616.

Other research training grants have been awarded to: University of Wisconsin, \$45,792; University of Minnesota, two grants of \$50,000 each; University of Kansas, \$38,802; Brown University, \$52,380; Stanford University, \$50,000; Washington University, \$11,577; Roscoe B. Jackson Memorial Laboratory, \$75,000; Massachusetts General Hospital, \$50,382.

Requests for information concerning this program should be addressed to the Research Grants and Fellowships Branch, National Cancer Institute, Bethesda 14, Maryland.

Historical Milestones in the Treatment of Congenital Dysplasia of the Hip

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CONGENITAL dislocation of the hip has been known and described since ancient times. Its important precursor, congenital dysplasia of the hip, however, has been recognized only since discovery of the roentgen ray. Since the existence of congenital dysplasia of the hip has been known, however, the basic concepts of diagnosis and treatment of this congenital deformity have radically changed. This brief historical review of the evolution of the treatment of congenital dislocation of the hip, and of the events leading up to recognition of congenital dysplasia of the hip, is presented with the hope that the "modern" concept of congenital dysplasia and its treatment will, as a result, appear more understandable.

The early "orthopedists" of the Indian, Egyptian, Greek and Roman cultures were too concerned with the treatment of that more socially acceptable patient, the injured warrior, to leave any worth-while records of treatment of the congenitally deformed. Orthopedics had its scientific beginning, along with the other branches of medicine and surgery, in the Hippocratic Corpus sometime between 400 B.C. and the first century A.D. Whether or not the physician Hippocrates had any actual connection with this amazing group of books, there is no doubt that it is the first medical work of any real scientific value, and while its principles were ignored or forgotten for centuries it is now recognized as the foundation of many of the modern methods of practice.

Congenital dislocation of the hip was well known and described in the time of Hippocrates. In the treatise, "On the Articulations," Hippocrates wrote: "Those persons, then, are most maimed who have experienced the dislocation *in utero*."¹ He also wrote: "There are persons who,

from birth or from disease, have dislocations outward of both the thighs; in them, then, the bones are affected in like manner, but the fleshy parts in their case lose their strength less; the legs, too,

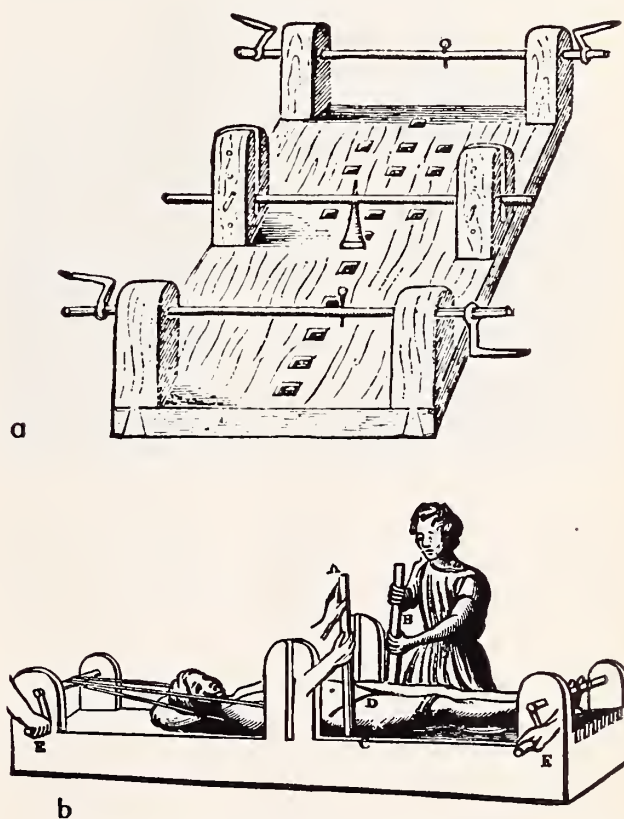


Fig. 1. The scamnum of Hippocrates. (Reproduced with permission from: Hart, V. L.: *Congenital Dysplasia of the Hip Joint and Sequelae* [in the Newborn and Early Postnatal Life]. Springfield, Illinois: Charles C Thomas, 1952, 187 pp.)

are plump and fleshy, except that there is some deficiency at the inside, and they are plump because they have the equal use of both their legs, for in walking they totter equally to this side and that."¹ The typical gait of the patient with either unilateral or bilateral dislocations of the hip joint was further described, as well as the shortened limb, the tilted pelvis, and the tendency to bear weight on the normal side. The increase in

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deformity in untreated patients was recognized and deplored.

Treatment of congenital dislocation consisted of reduction by longitudinal traction—the method



Fig. 2. Guillaume Dupuytren (1777-1835). (Reproduced with permission from: Osgood, R. B.: *The Evolution of Orthopaedic Surgery*. First Detroit Orthopaedic Lecture, Auspices of the Wayne County Medical Society, Detroit, Michigan, March 16, 1925. St. Louis: The C. V. Mosby Company, 1925, 70 pp.)

varied, however, with the age of the patient. Simple manual traction in a straight line was used in children. One method of reduction in adults consisted of suspension of the patient by his legs from an overhead beam. A strong assistant placed his arm across the patient's perineum and then swung free from a stand adding his weight to the patient's in the line of traction. The famous scamnum of Hippocrates was still more powerful, using windlasses to apply longitudinal traction. No manipulations of the joint were recorded—traction seemed to be the only method used for reduction and continued to be the only method of treatment for 2,000 years (Fig. 1).

In the early nineteenth century, congenital dislocation of the hip was still considered an incurable deformity. Use of braces and built-up shoes constituted the chief supportive measures designed to allow the patient to tolerate his

deformity. In 1826, Dupuytren² (Fig. 2), said to be the most highly trained French surgeon of his time, and characterized by Percy³ as the "first of surgeons and the least of men" because of his mean disposition, was the first to describe accurately the basic pathologic anatomy of the deformity. He wrote:

"The appearances I have found in such subjects are the following: All the muscles which have their attachments above or below the acetabulum were drawn up towards the crest of the ilium. Amongst these muscles some were well developed, whilst others were attenuated and slightly atrophied; the former were those which had preserved their action, the latter those the action of which had been cramped and limited, or even entirely negated by the altered relation of their attachments. Of the latter class some few were reduced to a sort of yellowish fibrous tissue, amid which the eye sought in vain for any trace of muscular fibre.

". . . The cotyloid cavity is either altogether absent, or presents only a small osseous, irregular prominence, where neither trace of diathrodial cartilage nor vestige of synovial or other capsule, nor fibrous margin is to be found; but which is surrounded by some tough cellular tissue, and covered by the muscles which are inserted into the smaller trochanter. Once, in two or three subjects which have been submitted for my examination, I met with the round ligament of the joint very much elongated, flattened above and, as it were, worn at certain points by pressure and friction of the head of the femur.

". . . The head of the bone itself is lodged in a hollow, somewhat analogous to that which is developed around it in accidental dislocations upward and outwards which have remained unreduced. . . ."

On the basis of necropsy findings, Dupuytren correctly concluded: "This displacement consists in a transposition of the head of the femur, from the cotyloid cavity on to the external iliac fossa (dorsum) of the ilium, a transposition which exists at birth, and which appears to be due to a defect in the depth or completeness of the acetabulum, rather than to accident or disease."

Dupuytren designed a girdle which attached to the pelvis and which supposedly exerted pressure directly on the trochanter and indirectly on the femoral head from above and laterally. While this apparatus was in favor for many years, Dupuytren's final conclusion as to treatment was that ". . . unfortunately, the deformity is incurable." However, as a result of his dissections and basic conclusions, it was not long before several methods of manual reduction were devised.

In 1835, Humbert and Jacquier² described a

method of treatment consisting of longitudinal traction with the application of lateral pressure. In 1838, Bouvier,² and in 1841, Pravaz,² reported reduction by manipulation. In 1847, Nélaton² described the line that normally passes the upper edge of the greater trochanter in running from the anterior superior iliac spine to the ischial tuberosity. Any displacement of the trochanter above this line was evidence of disease of the hip, and this line became a valuable aid in the diagnosis of congenital dislocation of the hip.

The period of these early investigations and attempts at manipulative reduction could probably be designated the "Pioneer Era" in the treatment of congenital dislocation of the hip; while the success of these methods was not remarkable by modern standards, nevertheless they stimulated further research and interest in a condition that up to then had been considered incurable.

Manipulative Reduction

In 1888, Agostino Paci,² one of the greatest orthopedists of nineteenth-century Italy, reported a method of closed reduction that depended on manual force to overcome any obstruction encountered during the manipulation. In 1894, he reported twenty-four cases in which this method of treatment was used. This was the first series of treated patients ever reported on. Upon publication of this report, both Adolph Lorenz² of Vienna and Hoffa² claimed that reduction was impossible by this method. However, only two years later, they both were advocating a method of reduction almost identical to Paci's, so that now it is Lorenz's name that is associated with the so-called bloodless method of reduction, and Paci, the true pioneer, is largely forgotten.

This method consists of flexing the affected hip of the anesthetized child until the femoral head is forced from its superior position to the posterior margin of the acetabulum. The thigh is then abducted, and with longitudinal traction applied to the leg, the leg is extended until the femoral head is levered over the posterior acetabular rim (Fig. 3). Lorenz was the first to advise subcutaneous adductor tenotomy to aid in the reduction when gentle massage of the adductor failed.

To maintain reduction, Lorenz² used plaster spica casts with the legs in 90° abduction, 90° flexion and 90° external rotation (the well-known

"frog position") for nine months. Obviously, the success of this method depended on the age of the patient when treatment was begun, yet no real attempt was made to begin treatment before the age of weight bearing.



Fig. 3. Closed method of reduction. (Reproduced with permission from: Hart, V. L.: *Congenital Dysplasia of the Hip Joint and Sequelae [in the Newborn and Early Postnatal Life]*. Springfield, Illinois: Charles C Thomas, 1952, 187 pp.)

At the Lorenz Clinic, however, the upper age limit for attempting manipulative reduction was still considered higher than at most other centers, but in most instances the method was found to be most successful in children less than three years of age. In time, however, the severe complications occasioned by the incorrect use of force during the so-called bloodless reduction caused it to be condemned and later to be replaced by adequate traction preliminary to either gentle manipulation or open operation when indicated.

Operative Methods of Reduction

Almost at the same time that manipulative methods of reduction were being developed, operative methods of correcting the deformity were being perfected. In 1835, Bouvier² recommended subcutaneous subtrochanteric osteotomy in the correction of late-stage deformity.

Pravaz² in France in 1847, and Brodhurst² in England in 1866, also recommended this procedure in older patients with marked deformity.

In 1840, Guérin² attempted tenotomy on all the muscles attached to the greater trochanter, and then planned to replace the femoral head without difficulty by simple traction. This reduction

failed since nothing was done to correct the hypoplastic acetabulum.

In 1879, Roser² resected the hip joint specifically to correct congenital dislocation. Correction

reported use of this procedure. Smith, Petersen and Lance² later improved the operation by use of bone chips above the shelf to increase the area of osteogenesis. Ghormley² was the first to use

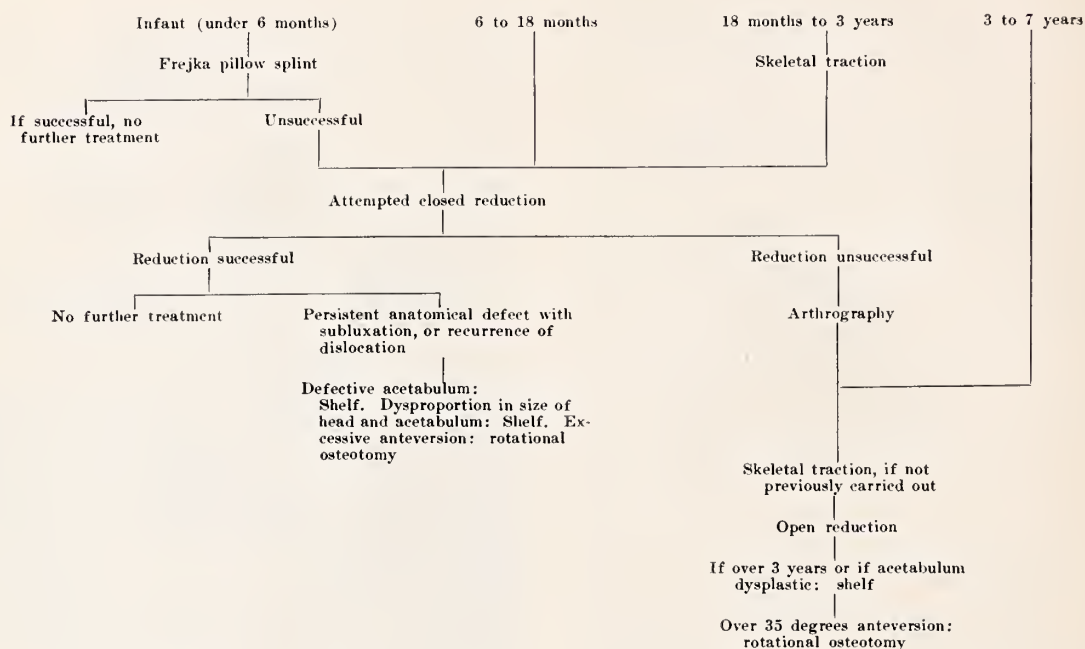


Fig. 4. Diagrammatic representation of the modern treatment of congenital dislocation of the hip. (Reproduced with permission from: Campbell, W. C.: *Campbell's Operative Orthopaedics*, Ed. 3. St. Louis: The C. V. Mosby Company, 1956, vol. 2, pp. 1105-2124).

of deformity was achieved at the expense of stability, and the operation was discarded.

The first logical operation devised for this deformity was performed by Poggi² in 1880, who was the first to take into consideration the observation of Dupuytren more than fifty years earlier that the basic deformity was due to hypoplasia of the acetabular roof, regardless of whether the femoral head was reduced or not. Poggi actually deepened the shallow acetabulum and remodeled the femoral head as necessary to complete the reduction.

In 1890, Hoffa² of Berlin adopted this operation, modified it somewhat, and advocated it widely. His name like Lorenz's gradually became associated with a procedure he did not devise.

In 1891, Koenig² used a slightly different approach to the basic pathology of the deformity and devised the first shelf operation for this condition. He described the operation as the construction of a bony "stop" or "block" for the femoral head. This consisted of a shelf turned down from the ilium just superior to the acetabular rim.

In 1904, Ferguson,² and in 1909, Jackson-Clark,²

chips from the anterior superior iliac spine and nearby iliac crest, and thereby called attention to this easily exposed source of available cancellous bone.

Albee² in 1913 devised a supra-acetabular sliding bone graft for a shelf, and in 1935 Compere² and Phemister² used a tibial graft as a shelf.

In 1918, von Bayer² recognized the fact that the chief cause of disability in many cases of congenital dislocation of long standing was the instability of the joint rather than its abnormal superior displacement. He concluded that in these cases it would be best to accept the dislocation but use the shaft of the femur as a strut for support against the acetabulum. He performed subtrochanteric osteotomy and attempted to place the proximal end of the shaft into the acetabulum. This was known as the bifurcation operation or osteotomy. Lorenz² adopted this operation in 1919 but did his osteotomy through the trochanters.

Shanz² modified the operation in 1922 because the proximal end of the shaft rarely remained in the acetabulum. He performed osteotomy well

below the lesser trochanter, and the proximal end of the shaft was placed against the ischium below the acetabulum.

Diagnostic Aids

Parallel to the development of both the closed and the open methods of treatment and equal to them in importance was the development of the various aids to diagnosis. The value of Nélaton's line in diagnosis has already been mentioned.

Development of the knowledge of x-rays discovered by Roentgen in 1895 helped to change the entire philosophy of treatment from that of treatment of dislocations as they occurred to that of early diagnosis and prophylactic treatment to prevent occurrence of dislocation.

In 1911, Shenton² described the line formed by the inferior margin of the neck of the femur and the superior margin of the obturator foramen. Its value, of course, has been in the x-ray examination of abnormal hips without actual dislocation.

Preiser⁴ in 1907 first suggested that congenital subluxation with poor adaptation between the femoral head and the acetabulum is the most common etiologic factor in the eventual development of degenerative disease of the hip.

In 1925, Hilgenreiner¹ of Prague introduced the term "congenital dysplasia" of the hip joint, which included both dislocation and subluxation. He emphasized three x-ray features of congenital dysplasia: (1) delayed development of the center of ossification of the capital femoral epiphysis, (2) increased angle of inclination of the acetabulum, and (3) lateral position of the most superior portion of the femoral neck.

In 1934, Kleinberg and Lieberman² first observed that the angle which the roof of the normal acetabulum makes with the horizontal is much less than that which occurs in a dysplastic hip. By measurement of this acetabular angle or acetabular index the possibility of dysplasia in a newborn could be predicted even before clinical examination was feasible.

Concept of Early Treatment

Another fundamental advance in the treatment of congenital dysplasia of the hip was development of the principle that the disease must be diagnosed and that treatment must be begun as soon after birth as possible.

Lorenz⁴ originally objected to early treatment mainly because of the difficulty in keeping the

child clean. He also claimed that the greater stability of the soft parts after the third year increases stability after reposition and so increases the chances for permanent reduction.

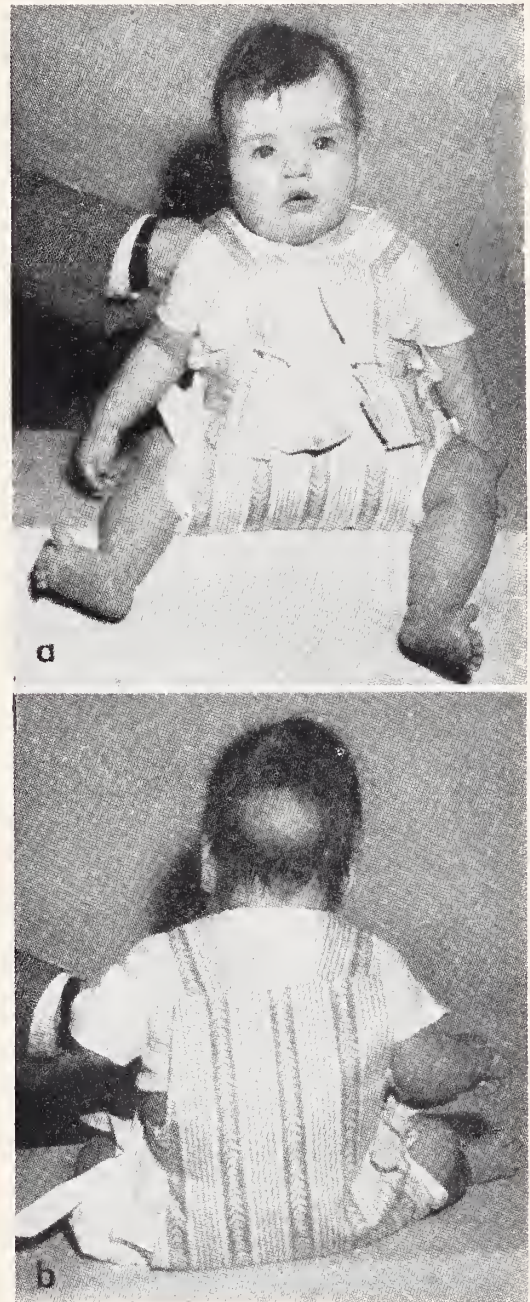


Fig. 5. *a* and *b*. The Frejka splint.

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Haglund⁴ of Sweden considered the best time for treatment to be at two to three and a half years of age. Patients in whom the disease was diagnosed before that age was reached often had

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Teaching Hernia Repair by McVay Technique

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THE AUTHORS have a combined experience of eighteen years during which they have used and taught exclusively the McVay method for repair of inguinal and femoral hernias. This method originally recommended itself to us because of the thorough anatomic studies on which it is based, and because we are in agreement with the two surgical principles which characterize the operation: (1) *Restoration of the transversus layer* (consisting of the transversus muscle and aponeurosis, and the transversalis fascia and fascia propria fused with this aponeurosis) as the primary and natural barrier against herniation, and (2) *repair of defects in the transversus layer by transposing normal tissue into them without tension*. The operation has been thoroughly and clearly described.^{1-3, 8-12}

Although the analysis of scientifically conducted follow-up studies at present available does not give a conclusive answer to the problem of recurrent hernias, sufficient data are at hand to indicate that in this respect the McVay operation is at least as good a choice as any.^{4,12} The authors are further influenced by the fact that though not all patients have been followed, they have yet to encounter a recurrence in any patient they have operated upon or assisted a resident to operate on by the McVay technique. This statement may well bring a smile to anyone who knows the pathetic fallacies of hernia follow-up statistics; our more intelligent patients, for one thing, if they have had a recurrence, doubtless tried their luck elsewhere.

Nevertheless, during the same period of time, we have each encountered repeated instances of recurrent hernia in patients operated upon by surgical trainees whom we are partly responsible for teaching, and who state that they were employing the McVay operation. We are chastened, moreover, by this evidence that our teaching of the procedure has not been successful. Probably both more teaching time by us at the operating

table and more specific didactic emphasis is needed.

In our efforts to remedy this situation we have analyzed the mistakes discovered when re-operating upon patients with recurrent hernia, where the original repair was said to be a McVay operation. Some of these errors are common to any type of hernia repair; others are peculiar to the McVay operation.

Extirpation of the Sacs

Failure to find all the peritoneal sac or sacs present in the inguinal-femoral region is a classic mistake, easily avoided yet frequently committed. It is a simple matter to open the peritoneum near the internal ring, whether or not an indirect hernia appears to be present, and to explore digitally from inside, the triangle of Hesselbach, the femoral ring, the obturator ring, and the internal abdominal ring, where an indirect sac may have been overlooked. Except in infants, this exploration should be routine. The older the patient, the likelier he is to have more than one sac. Even in infants, femoral hernias may be present along with the common indirect hernias, but the incidence seems to us sufficiently low so that exploration is unnecessary, and the required enlargement of the tiny peritoneal defect is perhaps unwarranted. Often the sacs in direct or femoral hernia can be pulled up and excised as part of the same defect used for exploration. The opening should be carefully closed with interrupted silk, flush with the parietal peritoneum. It may be added, however, that while there is abundant evidence that failure to remove completely a sac predisposes to recurrence, there is little evidence that failure to close the peritoneal edges is of any more importance here than it is after extensive abdominal operations for cancer, in which large areas of peritoneum are removed without subsequent herniation. The primary barrier against herniation is the transversus layer, and the importance of the sac lies in its capacity to keep open a defect in

¹Presented before the Saint Paul Surgical Society, February 15, 1956.

that layer. When all sacs are removed, the McVay technique provides fascial covering for all actual or potential inguinal-femoral hernia sites.

Defects Along Cooper's Ligament

The McVay operation requires suture of the lower free edge of the transversus layer, obtained by excision of all attenuated tissue surrounding the hernia, to Cooper's ligament, from the pubic tubercle to the femoral vein. We have encountered failures in this suture line at both ends and in the middle. The apparent causes of breakdown have been (1) an inadequate number of sutures, (2) failure to carry the suture line far enough in each direction, (3) interposition of extraperitoneal fat between stitches, and (4) excessive tension through failure to provide an adequate relaxing incision.

The optimum spacing of sutures has been worked out experimentally for fascial layers,⁵ and, as a general rule, the maximum tensile strength may be anticipated when stitches are taken 5 mm. apart and 5 mm. from the edge of a free fascial layer in which the large fibers run parallel with the edge. Only small bites are necessary in the dense tissue of the superior pubic ligament. In hernia repair the sutures certainly ought not to be further apart than 5 mm., and seven or eight of them are usually required for this approximation along the length of Cooper's ligament. Silk of size 3-0 or 2-0 is satisfactory. The suture line should begin right at the pubic tubercle. Both the free edge of the transversus layer and the entire extent of Cooper's ligament to be used in the repair should be carefully freed of all fat and areolar tissue by sharp dissection and finally by rubbing with dry gauze. This step will promote firm healing of the fascia.⁶ Great care should be taken that the peritoneal fat does not protrude between sutures as they are tied. This fat should likewise be painstakingly dissected from the area next to the femoral vein.

The lateral extent of this suture line is a crucial matter, and perhaps the commonest mistake we have found is failure to carry it far enough to close the femoral ring. The last stitch laterally should be behind the medial part of the femoral vein, but in the narrow type of pelvis it may be more conveniently taken in the pectineal fascia instead of Cooper's ligament. This is the deepest and one of the more difficult parts of the operation. The vein need never be injured if a finger is always interposed between it and the needle.

The vein should be clearly seen and should not be appreciably compressed when sutures are tied. Its sheath should not be removed as it helps to seal the ring. Spacing of the sutures along the transversus layer must be judged so that there is no lateral tension along this layer when the sutures are tied down on the rigid structure of Cooper's ligament. The vertical tension is determined ultimately by the length of the relaxing incision, which extends vertically near the midline for a distance of about 3 to 6 cm. upward from the symphysis pubis, through the inner two layers of the rectus sheath. This vertical tension is also determined at the time of operation, however, by the degree of relaxation produced under anesthesia, and it is not easy to obtain the optimum condition. When relaxation is complete there should be no appreciable tension. If the anesthesia is minimal and the patient restless, tension should not be greater at the suture line than elsewhere in the abdominal wall. We believe that the relaxing incision should never be omitted, otherwise we forego a principal advantage of this operation by forcibly stretching tissue out instead of sliding it over in normal condition.

The suture line in the transversus layer is continued up over the femoral sheath toward the internal ring. The sheath is frail, and sutures here can only serve to seal the vein against the transversus fascial edge, which is firmly held in place by the sutures in Cooper's ligament and the pectineal fascia. When favorably located, the stumps of the divided inferior epigastric vessels provide a good anchor for sutures. We have not observed any recurrence in this area except when the suturing to Cooper's ligament has been defective.

The Abdominal Ring

The internal inguinal ring is an opening in the transversus layer, and is not readily accessible from the outside. Surgeons are prone to attempt closure of this ring around the cord by suturing the transversus layer previously freed up medially, or even the more superficial internal oblique muscle, to the inguinal ligament. As students of anatomy realize, such a closure is a centimeter or more away from the real ring, and therefore does not close it. This area is a common site of recurrence with most types of repair. Proper closure can be difficult, but is attainable. The transversus layer on the lateral side of the ring composes the sheath over the external iliac artery, which is readily palpable.

The sheath is thicker than that over the femoral vein, and holds sutures well. It is usually obscured by fat, however. The ring should be closed so tightly that it slightly compresses the cord, and the fingertip cannot enter it. Postoperative swelling of the cord and testicle is not likely to occur as a consequence of tight closure of the ring. It is usually the result of blunt dissection of the cord, with damage to veins and lymphatics. Only sharp dissection with the scalpel should be used in separating the cord from the sac and surrounding tissues. Finally, the cord should be fastened to the internal ring with a few small "tacking" sutures so that it cannot slide in and out, perhaps pulling with it a wedge of fat or peritoneum.

Weakness of Tissues

We have seen recurrences directly through the transposed part of the transversus layer used to cover the original defect. This layer is normally not very thick, but is in the form of an intact, close-meshed sheet of collagen fibers. In some individuals, however, the layer is infiltrated with fat, and displays gross separations of the aponeurotic fibers. When in that condition it must be reinforced. The simplest expedient is to include the external oblique aponeurosis when making the relaxing incision, and to slide it down and suture it with the transversus layer to Cooper's ligament. The rectus muscle protects the resulting defect. An external ring is formed with Scarpa's fascia and the inguinal ligament. Where suitably aponeurotic, the internal oblique may be included with the transversus. An alternative is to turn down a flap of external oblique aponeurosis.⁷ Rarely is it necessary to use a free fascia lata graft for reinforcement or replacement of part of the transversus layer. This latter method is successful when properly used, and we therefore have not found it necessary to try dermal grafts, metal screening, or other such devices.

Preparation of the Patient and Postoperative Care

Several of the recurrences which we have seen have been in patients who had a chronic cough, obesity, or both. Other studies have shown the importance of these items in the genesis of wound complications. We believe that no elective surgery should be done until these conditions have been corrected. Abdominal distention and constipation can also be sources of stress on the healing wound and they should be prevented. If the colon is

cleansed before surgery and mineral oil by mouth provided liberally in the postoperative period, these events are usually avoidable. Retching or vomiting are likely to be especially damaging. We have observed our sutures being broken or pulled out when this occurred on the operating table. With general anesthesia, nasogastric suction should always be used; with local or spinal anesthesia, inhalation of oxygen is often helpful in preventing nausea and retching.

Any increased stress of this sort should be avoided for three weeks, and heavy exertion should be prohibited for three weeks more. After that, full activity should be resumed gradually without any permanent restriction.

No Necessity for Recurrence

Such are the sources of recurrent hernia in our experience with the McVay operation. We wish to emphasize that these are preventable. The fact is, recurrence of a hernia indicates the surgeon failed to do his best operation. Nearly every operator is perfectly willing to try another procedure on a patient who comes back with a bulging repair, thereby tacitly admitting the truth that something better should have been done the first time. A surgeon may remark that if a hernia repair of his breaks down, the only recourse will be to do a graft or transplant, implying that everything possible has been done with the tissues available in the area. On the contrary, this is seldom the case, and it is only necessary to carry out the McVay procedure exactly as it was originally described, in order to cure the patient. In a few instances, the tissues may have been defective, but here also the corrective measure should have been undertaken at the first operation.

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Bleeding from the Genitourinary Tract

With Emphasis on Traumatic Injuries

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HEMATURIA is simply defined as gross or microscopic blood in the urine and must always be considered an alarming symptom. All too frequently it is painless and intermittent in character. As a result some type of therapy often is instituted before the origin of the bleeding has been properly investigated. Bleeding is prone to cease with or without therapy after twenty-four to seventy-two hours. As a result, there is a tendency, both on the part of the patient and the physician to minimize the condition. This frequently leads to serious miscalculations in diagnosis with resultant disaster to the patient. Even though the hematuria may have ceased by the time the patient presents himself, the physician must always complete a thorough urologic investigation to determine, if possible, the source of the blood. Kretchmer¹ in reviewing 932 cases of hematuria, stated that the average duration between the first evidence of hematuria and diagnosis showed an elapsed time of about two and one-third years. This corresponds with a series of 1,600 cases reviewed by Dr. Charles Higgins² of the Cleveland Clinic in which the elapsed time between the initial bleeding and diagnosis was over two and one-half years. Dr. Edwin Davis³ of Omaha reported 1,000 consecutive cases of hematuria and classified his series as follows: 303 were seen in the first week, 233 cases during the next three weeks, 193 from one to five months, 85 from six to eleven months, 71 from eleven to eighteen months and 115 were not seen until eighteen months had elapsed. This record is better than those of the two authors previously mentioned, yet is still far from desirable. It is obvious that earlier diagnosis and initiation of definitive therapy is necessary if a satisfactory result is to be gained. Dr. Davis noted that 782 of the 1000 cases were caused by serious organic lesions involving the urinary tract. An additional 85 were diagnosed as cases of essential hematuria. In the

remainder, the bloody urine was caused by minor diseases which nevertheless needed definitive treatment. Doss⁴ reviewed nearly 6,000 cases of hematuria and found that inflammatory lesions, neoplasms, foreign bodies, tuberculosis and trauma were the most frequently found and in that order. Thus, it is apparent that hematuria is a most serious symptom and deserves immediate attention. My own records reveal 81 per cent of the patients with bladder tumors presented themselves with painless hematuria. One can conclude that approximately 80 per cent of all cases of hematuria are due to serious organic lesions.

The question of essential or idiopathic hematuria is one of the most perplexing situations encountered in the field of urology. Recently much has been written about lesions which cannot be demonstrated either through direct vision or by pyelography, but for which bleeding was sufficiently severe to warrant nephrectomy. Nation, Butts, and Massey⁵ described a lesion involving the entire kidney which they believed to be on an allergic basis and which presents a definite histologic picture. They feel that many of the cases of chronic hemorrhagic papillitis and purpuras belong to this group. It is my belief that true essential hematuria is rare indeed. If such patients are followed closely, the origin of the bleeding usually will become apparent.

Before investigating suspected cases, it is important to establish the presence of blood in the urine. A number of drugs such as aspirin and urotropine cause hematuria. Ingested red beets commonly discolor the urine. Two simple ways in which the presence of blood in the urine may be established are (1) microscopic examination of the urinary sediment and (2) the Meyer's test. The latter is a very simple but sensitive test for minute amounts of blood in the urine. It is performed by adding one cubic centimeter of Meyer's reagent to two cubic centimeters of urine and overlaying it with hydrogen peroxide. A purple color between the layers is indicative of the pres-

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ence of blood. It is surprising how little blood is necessary in the urine to produce grossly recognizable hematuria.

Certain clinical features of hematuria are helpful in determining the source. Initial hematuria suggests bleeding from the urethra distal to the external sphincter; terminal hematuria often means the patient is bleeding from the prostate or bladder; in the event of total gross hematuria one simply does not know the source without the use of x-ray or cystoscopy. "Fish worm clots" usually are formed in the ureter. When blood is well mixed with urine and does not clear up with irrigations, the source of bleeding usually is in the bladder. If irrigations do clear the urine, bleeding must have come from the upper urinary tract. There are other signs and symptoms which may help to indicate the source of bleeding. Clots passing through the ureter produce pain on the affected side and may simulate the passage of calculi. Flank pain with a palpable mass would suggest the kidney as a source of hematuria. As I previously stated, in painless hematuria a bladder tumor should be considered until disproved. These are all diagnostic clues, but a final opinion must be obtained through intravenous pyelography, cystoscopy and retrograde studies.

The sources of hematuria may be divided into three general classes: (1) Those concerned with diseases in the urinary tract itself (intrinsic); (2) those arising from neighboring viscera (extrinsic); and (3) hematuria associated with general disease. The possible causes of hematuria within the kidney include: trauma, neoplasms, stones, infections, congenital anomalies, polycystic disease, solitary cysts and nephritis. There are many others, and all are possibilities. Benign prostatic hypertrophy is more apt to cause bleeding than carcinoma. Within the bladder, bleeding is much more often caused from neoplasms, stone, tuberculosis, trauma and infection. In the urethra, stricture and trauma are the most commonly found etiologic factors. Appendicitis, pelvic infection, pelvic neoplasm, and diverticulitis are the most common offenders among extrinsic causes.

A discussion of hematuria due to injuries to the urinary tract will be covered in somewhat greater detail than the other causes of blood in the urine. Trauma of the upper urinary tract is not an uncommon finding and may be classified as follows: (1) Simple contusion with subcapsular hemorrhage; (2) minor parenchymal lacerations,

with or without capsular involvement; and (3) complete rupture of the entire organ involving the capsule, pelvis, and sometimes even the vascular pedicle, which is often rapidly fatal.

Anatomically, the normal kidney is well protected and injuries are usually confined to simple contusion or minimal parenchymal tears. More severe trauma is usually associated with penetrating wounds (stab or gun shot) or coexisting with complicated skeletal and visceral injuries. Severe damage can more easily result from acts of minor violence to a previously diseased kidney (hydro-nephrosis, cystic disease, neoplasms, et cetera) and evidence of a kidney traumatized out of proportion to the inciting injury should always excite suspicion of pre-existent renal pathology. Symptoms naturally will vary widely, according to the extent and number of associated injuries. It is well to keep in mind at all times that profound damage can be present and yet be well masked by associated complicating injuries, such as ruptured liver or spleen. Bleeding usually is mild and transitory with simple contusion and usually only moderate pain and tenderness are present. In the more severe parenchymal lacerations, pain and tenderness with a palpable mass in the flank, profuse hematuria, together with abdominal distention and shock, are the most commonly found symptoms. Early and precise information is imperative if conservative treatment is to be accomplished. No examination of a severely injured patient is complete without a routine examination of the urine, and if at all possible, a catheter should be passed into the bladder. If bloody urine is found the patient should have the benefit of an intravenous pyelogram as quickly as is compatible with his general condition. Even though the affected side reveals no function, the procedure can establish the presence of a normal opposite kidney, information which may be invaluable in the event that emergency surgery becomes indicated. It is my feeling that retrograde study usually is necessary for intelligent diagnosis and proper treatment. If, because of the patient's general conditions or lack of facilities, this cannot be accomplished, he should be watched very carefully. I have seen a number of patients admitted with minimal hematuria which cleared after several days, but which was followed after several weeks with an almost fatal hemorrhage. Fortunately, most injuries can be watched and treated expectantly with a high degree of success. Sar-

gent⁶ reported 206 cases of kidney trauma observed on the urologic service at the Milwaukee County General Hospital. He classified 120 as simple contusion (all of which needed no surgery), seventy-two as major parenchymal damage but comparatively normal pelvic architecture, and fourteen as a completely shattered kidney. In the group with major lacerations but intact pelvises, only two required immediate surgery. Of the remaining, only nine who were followed very carefully over a long period of time were subjected to surgical procedures for complications which developed later, including perinephritic abscess, atrophic kidney, Goldblatt's syndrome and the like. There were no deaths in this group. Of the fourteen cases of shattered kidney, six were diagnosed at autopsy. Nephrectomy was performed immediately in six more patients, and the other two were operated upon in conjunction with abdominal procedures for visceral injuries, both dying during the long surgical exploration. Procedures will vary according to the damage. These range from immediate nephrectomy after shock control, to drainage of extravasated blood with repair of the kidney. The kidney has a remarkable power of recuperation if given the opportunity through close observation and conservative treatment with the exercise of good judgment.

Injury to the lower urinary tract usually concerns itself with rupture of the bladder and/or urethra. The tear in the bladder may be extraperitoneal or intraperitoneal and may result from penetrating spicules of bone following a fracture of the pelvic bones. On the other hand, the rupture may be due to a direct blow over a full urinary bladder and is explosive in character. An empty bladder usually escapes injury even with crushing injuries to the bony pelvis. Symptoms vary according to location and the amount of damage. If the intraperitoneal extravasation of urine is present, symptoms of peritoneal irritation and ileus will soon make their appearance. They are often accompanied by varying degrees of shock. Pain and tenderness in the suprapubic area are present. The patient may be found to be dribbling or passing bloody urine. An early attempt should be made to catheterize the bladder, but this procedure should be discontinued if it is not accomplished with ease. If successful, a cystogram with a radiopaque agent should give one valuable information. The use of irrigating fluids

and measurements of the amount returned is mentioned only to condemn it, as it has been entirely inadequate. If indicated, repair of the bladder with abdominal exploration should be carried out as quickly as possible, with the object of draining the bladder and the prevesicle and retroperitoneal spaces.

Urethral trauma is usually the result of fracture of the pelvic bones, or a direct blow to the urethra such as occurs in straddle injuries. An important anatomic structure to keep in mind is the urogenital diaphragm. Rupture proximal to this organ results in extravasation to the spaces above, limited by the periprostatic and perivesicle fascial cleavage planes. In all cases of hematuria and, certainly, whenever the diagnosis of pelvic fracture is established, an attempt to catheterize the bladder should be made as quickly as possible. If any resistance is met, it should be discontinued. Since such injuries are all proximal to the urogenital diaphragm, the surgical approach should be suprapubic and with bladder an perivesicle space drainage. A catheter may then be passed retrograde through the urethra and a Foley catheter permitted to remain indwelling in the bladder. Urethral injuries distal to the external sphincter may vary widely according to the extent of damage. A slight, but constant, urethral bleeding is usually noted, and if seen early, and the damage is moderate, a catheter frequently can be passed into the bladder and left indwelling. On the first examination, there may be no evidence of extravasation to the perineum, but some hours later it may be found that there is swelling with ecchymosis and tenderness; perineal drainage should then be instituted as quickly as can be arranged. In the more severe injuries or in complete ruptures, the patient usually has retention with exquisite pain in the perineum and suprapubic area with marked swelling, tenderness, and discoloration of the perineal area. If some time has elapsed, the extravasation may be extended up over the abdomen before the patient is first examined. Usually a catheter cannot be passed by that time and the perineum should be drained as promptly as the patient can be brought to surgery. When the urethra is exposed, the clots are removed and the extravasated area is drained widely. A catheter frequently can be passed into the bladder through an external urethrotomy and left indwelling. If the ruptured urethra can be repaired it is well to do this promptly, but, if the patient's condition



Fig. 1.



Fig. 2.



Fig. 3.

does not warrant excessive surgery, secondary repair can be made when the patient's improvement permits. If the catheter cannot be passed or the patient cannot be moved, suprapubic cystotomy should be done at once with drainage. Varying degrees of stricture formation follow urethral injuries, and strict attention to their dilatation periodically must be followed, if the patient is to obtain and retain a good result. If the patient's condition is so critical that nothing can be accomplished initially, side tracking of the urine by simple trochar cystotomy will suffice temporarily, with secondary drainage of the perineum and repair of the urethra as quickly as can be done with safety.

The following case reports are illustrative of the conditions mentioned:

Case Reports

Case 1.—An elderly man, (C. J. T.), aged seventy-six, was admitted to the hospital December 14, 1952, complaining of hematuria with pain in the left flank, with some burning and smarting on urination, following an injury forty-eight hours previously. He had been struck over the left kidney and over the lower left chest by a large boulder falling from a truck. He was taken care of at the local infirmary and hospitalized overnight, during which time he was treated for mild shock. He had some difficulty in breathing, which was probably due to a fractured rib. He continued to have total gross hematuria and was admitted to my service for further study. He had had no difficulty with his urinary tract since having a transurethral resection for benign prostatic hypertrophy with complete retention in 1950. The rest of his history was not remarkable. His only complaint was tenderness over the left kidney and in the left lower chest with considerable muscle guard-

ing, but no palpable mass could be felt. The rest of his examination was essentially negative.

An intravenous pyelogram taken elsewhere had revealed a normal appearing right kidney, and a non-functioning left kidney. Therefore, on December 15, the day after admission, a retrograde study was done. The bladder was normal in appearance with blood seen coming from the left ureter. Catheters were passed up to both kidneys without meeting obstruction. Urine was obtained and sent for culture. The left kidney was filled by the gravity method and the roentgenogram disclosed opaque material apparently scattered throughout the minor calyces and parenchyma, suggesting a lacerated kidney (Fig. 1). The calyces were not well visualized. There was no extravasation beyond the capsule. The patient was therefore treated conservatively, and a transfusion of 500 cc. of whole blood was given. The hemoglobin was 61 per cent on admission and 71 per cent following the transfusion. A Foley catheter was left indwelling, although the patient was voiding well. Hematuria ceased after eight days. The catheter was then removed and the patient voided clear urine without difficulty. He was kept in the hospital for two more days of observation and sent home as ambulant but ordered not to work.

The patient returned January 23, 1953. Another retrograde study was made (Fig. 2), and marked improvement of the left kidney was evident. He was discharged to go back to his work, and recent follow up reveals that he is asymptomatic.

Case 2.—A nineteen-year-old boy was admitted to the hospital December 13, 1953 in shock following an automobile accident. He had sustained an injury over the right flank, followed by extreme pain and gross hematuria. He was watched for two days by the attending physician, during which time he continued having marked hematuria and increasing pain and ileus. He was given two transfusions. Because of a marked increase of the hematuria on December 16, I first saw



Fig. 4.



Fig. 5.



Fig. 6.

the patient in consultation. There was a large palpable tender mass in the right flank with associated distention of the abdomen. The bowel sounds were normal. A cystoscopy was performed, and it was noted that clear urine effluxed from the left side. Indigo carmine appeared in moderately good concentration in six minutes. On the right side, there was a constant flow of blood from the ureter. A catheter was passed up the right ureter and a pyelogram study was made (Fig. 3). Figure 4 shows a pyelogram of the left kidney revealing a congenital type of hydronephrosis with a definite stricture. An exploratory operation, performed the same afternoon because of uncontrollable bleeding, revealed the right kidney to be a badly ruptured hydronephrotic sac. In addition, there was considerable bleeding from a renal vein which had been torn. The kidney was removed.

Several weeks later, a left pyeloplasty with nephrostomy was done. The nephrostomy tube was left indwelling because the patient's azotemia failed to respond despite the nephrostomy drainage. However, he felt greatly improved despite his high blood urea, and he was discharged from the hospital with the nephrostomy tube in place some eight weeks later. A creatinine of 4.5 mg. per cent and blood urea nitrogen between 50 to 6 mg. per cent continued despite the plastic procedure on the left kidney and adequate drainage. He gradually lost strength and expired with symptoms of uremia the following September, eight and one-half months after injury.

Case 3.—A fifteen-year-old boy was admitted to the hospital March 18, 1955. In a scuffle, he had sustained a mild injury to the right ilio-costal space from the elbow of a boy companion, which caused no distress or pain at the time. The boy went to a restaurant, had lunch, and upon retiring at home at one o'clock noticed that he was passing bright red blood. By the next morning the bleeding had become more profuse and he was admitted to my service about four o'clock in the after-

noon. An immediate intravenous pyelogram was made which can be seen in Figure 5. One sees the shadow of an enlarged left kidney, which is normal in contour and architecture; on the right side, however, there is severe dilatation of the calyces, and the pelvis does not fill with media. This gives the impression of being a large hydronephrotic kidney.

The patient was treated expectantly because of profuse bleeding, and after thirty-six hours of conservative care with no abatement of the bleeding and after receiving three transfusions, he was taken to cystoscopy on March 21 where a retrograde pyelogram was made (Fig. 6). Nephrectomy was accomplished that afternoon. The pelvis was filled with 1500 cc. of old blood. A pre-existing pathologic condition was suspected before the patient's admission because of the minor type of injury.

Case 4.—A nine-year-old boy was admitted to the hospital March 13, 1954, following a straddle injury resulting from a fall on a fence rail. The boy voided well although a small mass was felt in the perineum. Because he was voiding without much difficulty, nothing further was done until I was asked to see him twelve days following the injury. At this time, there was a large indurated mass in the perineum, with discoloration. An extensive drainage of the perineum was accomplished surgically with additional drainage of the scrotum. An elliptical defect of the bulbous urethra was noted and a catheter was passed without difficulty past this defect into the bladder. It was felt that the indwelling catheter would allow satisfactory healing of the urethra in time and therefore no suprapubic cystostomy was done at this time. After removal of the perineal and scrotal drains, the wound healed well. The patient inadvertently pulled the catheter out, and on April 6 a suprapubic cystostomy was performed with the retrograde passing of the catheter into the bladder, which was left again for splinting purposes. The photograph of the x-ray picture shows the healing of the

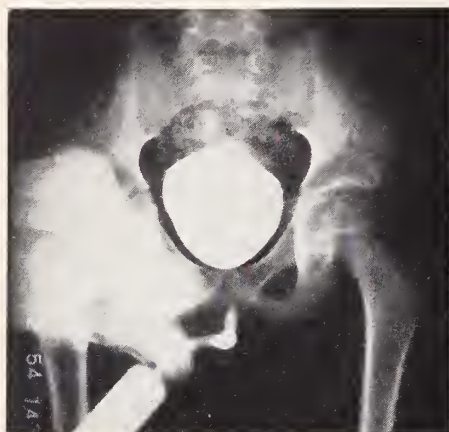


Fig. 7.

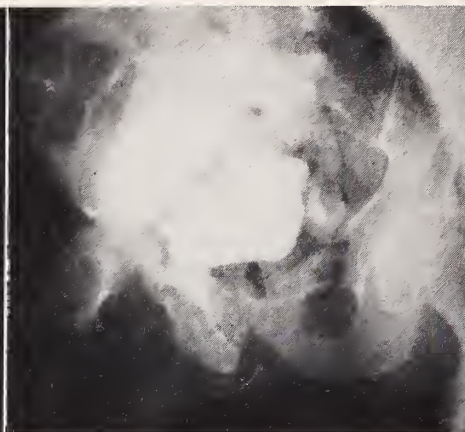


Fig. 8.

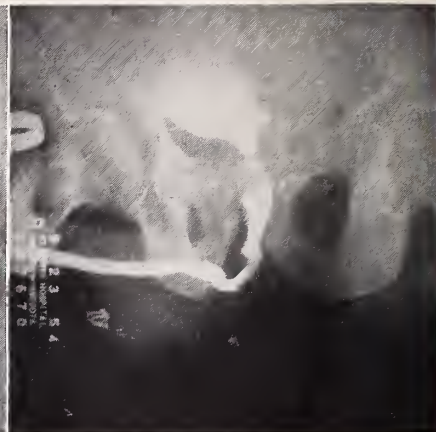


Fig. 9.

urethral defect (Fig. 7). The suprapubic catheter was finally removed May 28, some two months later, and there was no extravasation of dye in the urethra. The patient was voiding well with clear urine.

He was readmitted in September, 1954, at which time the urethra was calibrated by passing catheters and found to be entirely adequate. Cystoscopy revealed a normal bladder. It has not been necessary to dilate the urethra of this patient as frequently as usual. After another six months, the urethra was again calibrated and found to be entirely satisfactory.

Case 5.—A sixty-eight-year-old man was admitted to the hospital September 16, 1954, following a straddle injury to the perineum. There was considerable bleeding from the urethra and an accumulation of blood and urine in the perineum. The patient was taken to the operating room where perineal drainage was accomplished, and a rupture of the urethra was identified. A catheter was easily passed into the bladder. One suture was taken in the urethral tear and the perineal wound was closed about two Penrose drains. Following removal of the drains, the perineum healed without any further difficulty. The catheter was left indwelling as a splint. Four weeks later the catheter was removed and the patient was able to void in very small amounts. The calibration procedure disclosed that a twenty-four sound could be passed with ease. A check revealed 300 to 350 cc. of residual urine on several occasions. As a result of a cystoscopy examination, he was found to have a benign prostatic hypertrophy with marked trabeculation of the bladder, cellule formations, and one opening to a large diverticulum (Fig. 8). Following transurethral removal of the prostate, the patient voided 200 to 300 cc.'s at a time but still carried a large residual, amounting to 150 to 200 cc. On one occasion I checked his residual immediately after voiding, and found 15 cc., but ten minutes later I found 120 cc. In my opinion, adequate resection had been accomplished, and therefore diverticulectomy was performed. Following this, the patient has been able to void and empty his bladder well. His urethra has been dilated at six week intervals and its calibre remains adequate. (Fig. 9.) Cystourethrogram reveals an increased calibre of the urethral stricture and the definite improvement of the bladder following the removal of the large diverticulum.

Case 6.—J. B. H., aged twenty-five, was admitted to the hospital May 30, 1947, after being struck by a truck. He was first seen in the emergency room in shock, with fractures of the right tibia, left clavicle, right ulna and the ninth, tenth and twelfth left ribs. It was also noted that he had a moderate hematuria. The patient's condition improved following symptomatic treatment and the fractures were taken care of by an orthopedic surgeon. The hematuria ceased spontaneously after the third hospital day. His condition remained good until June 19, three weeks after his injury, when it was noted by the nurse at 5 p.m. that he was passing profuse amounts of blood and clots in the urine. Shortly after this, I was asked to see the patient, who by that time was in shock with greyish white pallor, rapid pulse, and a blood pressure of 80 over 60 mm. of mercury. Transfusion was started immediately, and he was taken to the cystoscopy room where a size 16 cystoscope was passed without anesthesia. Clear urine was seen to efflux from the right ureteral orifice, and there was a continuous and profuse flow of blood from the left ureteral orifice. Indigo carmine was recovered in good concentration from the right kidney in three minutes. Repeated attempts to make a pyelogram failed, for as fast as the catheters could be changed they became plugged with clotted blood.

The patient's state of shock became worse, so he was taken to the operating room immediately. He was rapidly prepared for surgery, and with little regard for surgical technique, nephrectomy was accomplished as rapidly as possible. Once the kidney was visualized, profuse bleeding was encountered and, to borrow a phrase from the late Dr. Artie Law, "Gentlemen, the hemorrhage was simply wicked." The kidney was completely covered by organized blood clots, but with sharp and blunt dissection the kidney was freed and pedicle clamps applied. Seven units of blood were given during the procedure. Following this, the patient's condition immediately improved. The blood pressure had become imperceptible but returned after a few minutes. The kidney was removed without further difficulty. Examination of the kidney revealed a laceration which extended from the hilus to the convex surface, practically bisecting the kidney. It was interesting to note that this

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Diagnosis and Office Treatment of Sinusitis

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SINUSITIS may be defined as inflammation of the mucous membrane of the paranasal sinuses. In recent years, the approach to the problems of diagnosis and treatment has changed and review of some of the basic concepts seems justified.

Defense

Primary.—The first line of defense of the nose against infection consists of the combination of the mucous blanket, the ciliary stream and lysozyme lying on an intact ciliated epithelium. Control of this mechanism is basically autonomic, and autonomic disturbances have been shown to disturb its defensive ability. Wolff and co-workers¹ have shown the deleterious effects of emotional and stress-provoking stimuli on this protective apparatus. Chilling of parts of the body disturbs the mechanism; ischemia, drying and change to an alkaline pH result, together with inhibition of lysozyme. Similar disturbances in surface defense, either general or localized, may be results of the following: (1) dietary or alcoholic excesses, (2) nutritional deficiencies, (3) anatomic deviations producing dry spots or severe obstruction, (4) endocrine abnormalities, (5) use of some drugs, (6) severe systemic disease, (7) too low atmospheric humidity, and (8) intranasal medication.

The last needs amplification. Alkaline medication destroys lysozyme. Irritating substances may stop ciliary motion or kill the epithelium. Oily substances may render the mucous blanket too viscid to move. Potent vasoconstrictors may upset the delicate vasomotor control. Allergic disorders produce edema and disturbance of mucosal drainage.

The foregoing consideration is not exhaustive. Other factors also may affect surface defense and

thus interfere with removal of the products of infection of the nasal sinuses.

Secondary.—If the surface defense fails, the stroma prepared for its role by the epithelial infection becomes the defense organ. The protection is provided by leukocytes, antibodies, histiocytes and other agents from the blood called to the stroma in the acute inflammatory reaction. If this defense is adequate, the infection is resolved in two or three days. If it fails, or if secondary bacterial invasion overwhelms it, then acute sinusitis of variable severity follows. The stroma continues to be the defensive tissue until healing occurs or the defense is overwhelmed and the condition becomes chronic, or the infection spreads beyond it.

Modes of Infection

Infection may reach the sinuses in ways other than by direct continuity from the nose: (1) It may be secondary to swimming, diving and sudden changes in barometric pressure; (2) infections about the teeth may involve the maxillary sinus, and the oral contamination that occasionally follows extraction of teeth may extend into this same sinus; (3) infection may follow contusion or perforation of a sinus; (4) vigorous nasal packing sometimes causes infection of a sinus; and (5) the Proetz type of displacement therapy may induce sinusal infection.

A common factor in these modes of infection is that the sinus is grossly contaminated and injured at a time when the stroma has not been prepared for it by a preceding inflammatory reaction, such as attends acute coryza. Consequently, suppuration and necrosis usually are more extensive than otherwise they would be.

Several factors tend to promote continuing, recurrent infection or spread of infection. The most important of them is impairment of drainage, which may be due to narrowing of the drainage paths from whatever cause or to failure of the ciliary stream to function. Other factors include: (1) virulence of infection; (2) lowered resistance

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of the host; (3) constant reinfection from adjacent sinuses, the lower part of the respiratory tract, and persistent dental infection, and (4) improper treatment.

Causative Organisms

The precursors of sinusitis are the virus or viruses of acute coryza. The microorganisms usually found in cases of sinusitis include pneumococci, streptococci, staphylococci, *Hemophilus influenzae* and bacteria of the genus *Klebsiella*. If the maxillary sinus has become infected because of dental extraction or dental abscess, mixtures of oral organisms are found. When closed cavities are infected, anaerobic organisms, usually anaerobic streptococci, may be isolated. In recent years, accompanying the promiscuous use of antibiotics, infections with Gram-negative organisms, especially chronic infections, are occurring in increasing numbers. To know the type of organism present is important when sulfonamides and antibiotics are used in treatment.

Tissue Changes

The epithelium may become thickened or papillary; it may change to a stratified squamous or polypoid type. As has been said, furthermore, after infection has occurred, the stroma becomes the site of defense and it undergoes definite pathologic changes. In the presence of acute disease, the inflammatory reaction is acute and proliferation predominates. Consequently, the stroma is thick, occasionally twenty to thirty times thicker than normal, and adjacent bone may undergo proliferative change.

Symptoms and Signs

Sinusitis may be classified in five groups: (1) fulminating, (2) acute suppurative, (3) subacute and recurring suppurative, (4) chronic suppurative, and (5) chronic nonsuppurative and mixed (hyperplastic). The first three groups may be considered as acute types of sinusitis and the last two as chronic types.

The symptoms of acute sinusitis include fever, malaise, headache, a sensation of fullness of the head, nasal stuffiness or obstruction, mucopurulent or purulent nasal discharge, postnasal discharge, cough, sore throat, anosmia and pain. The pain of sinal disease tends to be local: that related to the maxillary sinuses, in the cheeks, teeth and often the supraorbital regions; that related to frontal sinuses, in the frontal or temporal regions;

that of ethmoid disease, in the region between and behind the eyes and in the supraorbital region, and that of sphenoid sinusitis deep in the head, behind the eyes and occasionally in the occiput or vertex. The pain usually results from the pressure of infection in a closed cavity or from edema involving nerve endings near the sinal ostia. Pain of sinusitis often is intermittent, may follow a daily pattern as in the "union" headache, and usually is aggravated by coughing, stooping and straining. Pain of sinusitis occurs most commonly with acute infections, including acute exacerbations of chronic disease. The pain, fever and malaise usually decrease with the onset of drainage. Tenderness over the infected sinus is of frequent occurrence. When a frontal sinus is concerned, tenderness is felt over the floor and anterior wall. When infection is of the maxillary sinus, tenderness is in the canine fossa. The medial orbital wall is the site of tenderness in the presence of infection of the anterior ethmoid cells. Occasionally, depending on the sinus infected, the eyelids, frontal region and cheek may be edematous.

Usually the nasal mucosa is red and swollen, especially in the region of drainage of the sinuses involved. Likewise, purulent secretion may be seen in these regions of drainage, which are the anterior middle meatus for the frontal and maxillary sinuses and the anterior ethmoid cells; the superior meatus and spheno-ethmoid recess for the posterior ethmoid cells and the sphenoid sinuses. Care must be taken in the interpretation of this finding, as mistakes are very possible. In general, as the process subsides the discharge becomes thicker and then of reduced quantity; moreover, most of the symptoms lessen. In the chronic types of sinusitis, the general symptoms are much less pronounced than in the acute types. Williams² has pointed out why the headache usually complained of by patients with chronic nonsuppurative sinusitis is due not to the sinal disease but to the accompanying allergic or pathergic disorder. Fatigue and mental dullness are of common occurrence. Nasal obstruction may be present, occasionally with anosmia, but the predominant significant symptom is mucopurulent to purulent postnasal discharge. Other symptoms may include chronic cough, irritated throat, hoarseness, and nasal odors. Of the many other symptoms ascribed to chronic sinusitis, most if not all are considered coincidental. Findings on

examination are minimal except for discharge and frequently associated other abnormalities, such as polypoid changes and edema.

Diagnosis

The diagnosis of sinusitis depends on the history, inspection of the nose, roentgenologic examination and the results of lavage of the affected sinus. Both anterior and posterior rhinoscopy should be performed. Irrigation of the ethmoid cells is not feasible, nor it is often feasible when the frontal or sphenoid sinuses require treatment; suction, following shrinkage and cleansing, however, frequently discloses the source of the secretion. Roentgenograms seldom are needed in diagnosis of obvious acute sinusitis, but they are of great value in establishing the presence of chronic sinusitis. Pattee³ compared the relative value of several procedures used in the diagnosis of chronic maxillary sinusitis and concluded that: (1) roentgenograms, nasal examination, and the history were of value in that order in focusing attention on the maxillary sinus as the source of disease; and (2) lavage was by far the best means of determining the activity of the disease. Other methods used for diagnosis are transillumination, antroscopy, cytologic studies, bacterial cultures, contrast roentgenograms and planograms, biopsy, studies of the blood, allergic surveys, and so on.

Treatment

Present treatment of sinusitis is the result of improved understanding of the subjects just covered. Methods of today contrast with those in use following the discovery of cocaine in 1885 when radical treatment was guided by the concepts of free drainage (the more the better) and of removal of all diseased tissue. For example, epithelial changes were considered irreversible and the affected tissue was removed. The present trend is toward conservatism and restoration of a physiologic situation.

General treatment consists of supportive and antibacterial measures.

As general supportive measures, analgesics and sedatives are administered, and dietary measures, rest, quiet, avoidance of chilling and avoidance of overindulgences are prescribed. These measures are useful primarily in the acute types of sinusitis and should be employed as freely as necessary.

Antibacterial measures include administration of sulfonamides, antibiotics, vaccines and serums. Topical use of sulfonamides and antibiotics has

proved unsatisfactory. On the other hand, in cases of acute sinusitis, systemic use of these agents has decreased both the necessity for surgical measures and the morbidity, and has controlled most of the complications. Use of the agents named, however, in no way obviates the need for adequate drainage. It is probably advisable in most cases, if not in all of them, to obtain cultures and to study the sensitivity of the isolated microorganisms to the action of therapeutic preparations; then the agent to which the organism is most susceptible can be used. In the interval before the reports of results of cultures and sensitivity studies have been received, a combination of penicillin and streptomycin may be administered to combat one or more of a rather wide variety of possible invaders. It is important to use enough of a preparation, long enough, to kill an infecting organism rather than to enhance its resistance to the therapeutic substance. Most writers on the subject have expressed the belief that these agents should be given only after the appearance of pus, not during the coryzal stage of acute sinusitis, and that they accomplish nothing against chronic sinusitis. Vaccines and serums are useful occasionally in treatment of chronic suppurative sinusitis and in allergic cases.

Drainage-promoting measures remain the *sine qua non* of treatment in cases of sinusitis. Most authors have written that a diseased sinus will not heal unless drainage is obtained, regardless of what other measures are used. In acute sinusitis the early, severe edema and epithelial damage interfere with drainage. In two or three days, however, drainage probably will be obtained through the mucociliary mechanism. In many instances all that is necessary to help this natural mechanism is to avoid further injury to it. For this reason moist, warm air and an adequate intake of fluid are helpful. Avoidance of drugs that induce drying and of intranasal medication that injures the mucociliary system furthers this aim. Some of these injurious agents are menthol, camphor, alkaline and sulfonamide solutions, antiseptics, oily substances and strong solutions of cocaine. Prolonged douching also is injurious. When the head is semi-erect, gravity helps drainage. Tobacco and alcohol tend to increase swelling and are better avoided.

A controversial subject is that of vasoconstrictors which are used to provide temporary relief of nasal obstruction and to increase ostial drainage.

Fabricant⁴ stated that the ideal agent had not been found because all in use had a secondary, "rebound" effect, probably from the fatigue of the vasoconstrictor muscle fibers. This fatigue results in a period of mucosal swelling after the power of the vasoconstricting agents has been dissipated. For this reason, many rhinologists deprecate the use of vasoconstrictors or suggest sparing use of only moderately potent drugs. Of these, the best are thought to be 1 to 2 per cent solution of ephedrine hydrochloride and 0.25 to 0.5 per cent solution of phenylephrine (neosynephrine) hydrochloride, both applied topically. These are believed to do little injury to the nasal tissue but still to retain some effectiveness. The controversy over the use of vasoconstrictors goes on.

The preceding measures, or some of them, are usually sufficient in the early stages of the acute sinusitis. After seven to ten days, if drainage still is inadequate, irrigations by cannula or displacement treatments usually are instituted. In addition, minor surgical procedures, such as infraction of the middle concha, may be used to open constricted channels of drainage. Generally, manipulations and cannulations are ill-advised early in the disease, as they confer little benefit and invite spread of infection. Lavage of a sinus also is not without some dangers, one of which is formation of air embolism.

Many physicians employ displacement treatment, but again dangers exist, one of which is that the solution tends to enter and contaminate uninvolved sinuses and the eustachian tube. The Dowling pack provides slow decongestion with no "rebound"; this, followed by gentle suction, works well, but is condemned by some persons as being irritating and a ciliary inhibitor. Use of hot compresses, infrared lamps and diathermy gives much subjective relief and encourages drainage. Heat is best used after the early edematous stage; if heat is used in the course of the edematous stage, it can aggravate the pain.

After active infection has subsided, for chronic types of sinusitis surgical measures to facilitate drainage may be indicated. Although minor procedures, irrigation of the maxillary sinuses, displacement, and use of Dowling packs are effective at times, promotion of drainage in the presence of chronic disease of the nasal sinuses is primarily a surgical problem.

Anti-allergic measures are important, especially for chronic, nonsuppurative disease, but also for

mixed chronic sinusitis. These include hypsensitization, use of antihistamines and vasodilator drugs, avoidance of offending allergens and other control of the environment, although change of climate is of questionable value.

Prophylactic measures are many and varied, and include any and all means which improve drainage and effect the strengthening of the two defense systems, epithelial and stromal.

Roentgen therapy, especially for acute frontal sinusitis, has significantly helped in alleviating pain. In 70 per cent of a series of cases compiled by Popp and Williams,⁵ it brought about earlier resolution than otherwise would have been expected.

Special Problems.—A few special problems in treatment arise in certain situations. Fulminating sinusitis, of which swimming is a predisposing cause, is usually a closed-cavity infection; hence, there is no drainage and a situation favorable to the growth of anaerobic microorganisms is present. The stroma is involved before any inflammatory defense has been set up. Severe prostration, pain and serious threat of spread are characteristics. Use of potent analgesics, of vasoconstrictors, of antibiotics effective against a sufficiently wide variety of microorganisms, and heat are indicated. It is generally thought that without obvious evidence of improvement within twelve to twenty-four hours, and certainly with evidence of increasing infection, drainage should be obtained at once by surgical means. The maxim of early conservatism does not hold in this situation. The frontal sinus is usually the one involved.

About 10 per cent of acute maxillary sinusitis is of dental origin. It is uncommon among children. The acute maxillary type is another massive infection of an unprepared stroma and usually has severe effect upon the mucous membrane. Unilateral location, foul odor, and severe systemic symptoms are typical. Drainage must be helped by vigorous means, and broadly effective antibiotics should be used. Failure of early resolution usually indicates that surgical drainage will be needed.

Obstructive arosinusitis is produced by sudden barotrauma, usually an increase in the atmospheric pressure while the ostium is occluded as by a polyp or inflammatory swelling. The resulting relative negative pressure in the sinus produces stromal damage and hematoma. This process may

subside without infection; but if infection does occur, the disease will be severe—again because of the unpreparedness of the stroma — and vigorous treatment is in order. Sinusitis from fractures and other trauma will behave in very much the same fashion as this type.

Sinusitis of specific cause such as tuberculosis, actinomycosis, rhinoscleroma, and so on, is rare. The treatment is that of the infection present.

Children.—Sinusitis of children differs somewhat from that of adults. Antral and ethmoid disease is possible from birth, and frontal and sphenoid disease becomes possible at from four to seven years of age. Infection of sinuses of children is probably more common than is realized. Systemic reactions and local cellulitis afflict children more frequently than adults, the maxillary and ethmoid sinuses being those usually involved. Ethmoiditis is accompanied by orbital complications more frequently among children than among adults. Subacute and chronic sinusitis of children are commonly manifested by frequent colds, runny nose, stuffy nose, chronic cough, and recurrent sore throat. There may be recurrent otitis, apathy and fevers. Anosmia leads to anorexia. The diagnosis and treatment do not differ from those for adults, but the methods are not so easy to apply. Pulmonary complications are common in children with chronic types of sinusitis, and adenoidal disease may promote chronicity.

Complications

The incidence of complications of sinusitis has been greatly reduced by the use of antibiotics, as well as by more conservative early treatment—so much so that serious complications are now unusual. Complications of sinusitis may be classified as follows:

1. Spread by mucosal continuity
 - (a) Nose (acute sinusitis in other sinuses, acute rhinitis)
 - (b) Nasopharynx (nasopharyngitis, otitis media, mastoiditis)
 - (c) Pharynx and larynx (pharyngitis, tonsillitis, laryngitis)
 - (d) Lower part of respiratory tract (tracheitis, bronchitis, pneumonia, bronchiectasis)
 - (e) Eye (conjunctivitis, dacryocystitis)
2. Spread by vascular, lymphatic or direct extension
 - (a) Orbit (edema, cellulitis, abscess)
 - (b) Facial soft tissues (cellulitis or abscess of cheek, forehead and adjacent soft tissues)

- (c) Facial and cranial bones (osteitis, osteomyelitis, fistulas to surface, dura or mouth)
- (d) Cranial cavity and its contents (meningitis, subdural empyema, extradural abscess, brain abscess, venous sinus thrombosis)
- (e) Septicemia or metastatic abscess in a part other than the head

3. Others

- (a) Focal infection
- (b) Mucocoele and pyocoele

Spread by mucosal continuity is still of common occurrence and may occur in the course of any stage of sinusitis. Faulty nose blowing, misdirected early treatment (such as displacement treatment and nasal douching) and virulent infections tend to increase the incidence of the complications listed in Group 1. Their diagnosis and treatment are the same as for any of their causes, with proper management of the sinus disease added.

The more serious but fortunately now rare complications of sinusitis are those listed in Group 2. Spread occurs most commonly by venous emboli and by way of veins that are sites of periphlebitis and thrombophlebitis, often of retrograde type. Lymphatic structures play a role in bringing infection to perivenous tissues. Lymphatic spread can take place via the perineural spaces of the olfactory nerves to the subarachnoid space and thence to the orbit and face. Spread may also occur by extension from sinuses in the bony walls of which are defects that may be congenital, traumatic, operative or disease-produced. Spread of ethmoiditis to the orbit is commonly by such a route, but spread from the ethmoid sinus may occur in any direction. The complication depends on the location of spread. Osteomyelitis occurs mostly in the frontal bones, rarely in others. Among intracranial complications, 45 to 60 per cent used to be postoperative; but these now are rare, thanks to prophylactic use of antibiotics in conjunction with surgical treatment of the sinuses. Meningitis is the most common complication in the cranium at present. The various entities present signs and symptoms no different from those of the same diseases arising from other causes, and their nonsurgical treatment is also similar. Two points are important, though. When these complications result from sinus disease, the sinus must be drained at once or as soon as local resistance and antibiotics have controlled the spread of infection. The widespread use of antibiotics for minor respiratory illnesses

has resulted in so obscuring the spread of sinusitis that at times silent or unexpected complications occur.

Mucocele and pyocele are complications which are primarily surgical in management.

Comment

Important studies of sinusitis have been concerned with the etiology, pathogenesis, physiology and defense mechanisms, both surface and stromal. From these studies have come present-day concepts of nonsurgical treatment, which may be expressed in these generalizations:

1. Sinus health is based on an intact functional mucous membrane and free drainage.

2. Identification and control of some of the many factors that disturb normal mechanisms have assumed increased importance.

3. Treatment is aimed at restoring structure and function to normal, not at removing structures to the destruction of function.

4. Adequate drainage remains the keystone of treatment.

5. Antibiotics are potent new weapons against sinusitis, especially against the acute disease and complications.

6. Chronic sinus disease is still too often not appreciably aided by nonsurgical measures and remains a challenge to the rhinologist.

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CONGENITAL DYSPLASIA OF THE HIP

(Continued from Page 11)

to wait for treatment. Ridlon⁴ also expressed the belief that treatment should be started only after the age of weight bearing.

In 1939, Putti⁵ made the greatest contribution to the modern treatment of this disease; he reported a cure rate of 94 per cent in children in whom the condition was recognized at a very early age and who then were treated by the abduction method. He emphasized that it is important to educate parents and physicians in the early recognition of the condition and in the necessity for beginning treatment immediately. He stated: ". . . Therefore one must reduce the age limit, *indeed abolish it completely*, and fully accept that principle, which all orthopaedic surgeons follow in the treatment of all congenital deformities, and which one sees no reason to repudiate in that of congenital dislocation of the hip—that is, to *begin treatment the very moment the deformity is observed*, even if that be on the day of birth."

Modern Methods of Treatment

To attempt even to enumerate the many

methods of treatment of congenital dysplasia and dislocation of the hip in use today would be far beyond the scope of this article. However, it seems worth while to show diagrammatically the possible steps in the present management of this condition as influenced by the age of the patient when the diagnosis is established. This is done in Figures 4 and 5.

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Psittacosis in Minnesota

A Review of the Last Ten Cases Seen at University of Minnesota Hospitals

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THE RECORD of psittacosis apparently dates to 1879, when a Swiss bird fancier, following receipt of a collection of parrots, noted a severe respiratory illness among seven members of his household which was fatal to three.⁸ Parenthetically, the parrots fared no better. It required fifteen years for Morange to identify the parrot as the vector of this malady, and he named it psittacosis. (Gr. Psittakos-Parrot)¹⁵

Serious thought was directed at the disease after the great epidemic of 1929-30 which involved some 800 persons in twelve countries, with a 20 per cent mortality.³ Since the pandemic appeared to have begun in Argentina and then spread to North America, England and Europe, many countries of the world imposed a strict embargo on the shipment of psittacine birds which resulted in a gratifying rarity of the disease until 1951 (Table I). At this time, the embargo was lifted because sufficient evidence was available to show that other than psittacine birds were an important reservoir of the disease, and that effective antibiotics were at hand. Since the embargo-lifting, however, an alarming increase in reported cases has occurred, and one may assume that reporting is far from perfect. This reappearance of the disease, which has awakened the interest of the medical profession, is due to the lifting of the embargo on psittacine birds and to their booming popularity as household pets.

The malady is rare in children (only 5 per cent of the cases in most series occur in persons under age fourteen),¹⁰ and has a varied clinical spectrum. Most patients complain of malaise, chills, fever, a dry cough, severe headache, myalgia and pleuritic pain. In our group of cases (Table II) fever was accompanied by shaking chills in five patients. The cough was more often dry than productive, and tended to be "irritative," causing

paroxysms of cough. Headache was a prominent symptom, and at least two of the cases were initially considered to have acute sinusitis because of the severity of the headache. The fever, chills,

TABLE I. PSITTACOSIS CASES BY YEAR

Year	Minn.	U.S.A.
1931	3	
1932	24	
1933	1	
1934	0	
1935	0	
1936	0	
1937	0	
1938	0	
1939	0	
1940	0	
1941	0	
1942	2	
1943	0	
1944	0	6
1945	0	27
1946	1	26
1947	0	27
1948	0	32
1949	1	35
1950	0	26
1951	1	25

EMBARGO LIFTED DECEMBER 1951

Year	Minn.	U.S.A.
1952	9	135
1953	6	169
1954	16	444(8)
1955	32	

TABLE II.
SYMPTOMATOLOGY IN TEN CASES OF PSITTACOSIS

Symptom	Number
Malaise	9
Fever	7
Cough (Dry)	7
Chills	5
Headache	5
Pleuritic Pain	4
Myalgia	4
Cough (Productive)	2
Anorexia	2

myalgia and malaise with dry cough most often suggested the diagnosis of "flu," and the presence of pneumonia was not suspected until roentgenograms disclosed a pulmonary infiltrate. The onset of the disease may be gradual or abrupt, usually follows an incubation period of about ten days.³ Symptoms subside in two to three weeks, although

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many persons remain ill for months (Case 1) and relapses have been noted.

Physical examination may be completely unrewarding, as early in the course of the disease the pneumonia is interstitial, and hence silent. Later, rales may appear, and an enlarged, soft spleen may be noted. Occasionally a skin rash may be seen, simulating the rose spots of typhoid fever.¹⁵

The leukocyte count ranges from five to ten thousand and chest roentgenogram may disclose an area of pneumonitis which has been variously described as "ground glass" or "fluffy opacification."³ As seen in Table III, our cases ranged in age from nineteen to sixty-three years, and were rather evenly divided with respect to sex. The source of infection was a parakeet in five instances, was undetermined in three instances, and was clearly related to non-psittacine birds in two cases. The chest x-rays of all patients disclosed a definite area of pneumonia, except for one which the radiologist described as bilateral pulmonary congestion.

The etiologic agent is a large virus which, in psittacine birds, is named *Miyagawanella psittacii*. *M. ornithosis*, the virus in non-psittacine birds, is in the same antigenic family, as is the virus of lymphogranuloma venereum. The terms "psittacosis" and "ornithosis" are used, respectively, to designate disease arising from contact with psittacine and non-psittacine birds. The virus, lodged in the spleen of affected birds, may or may not cause illness in the bird, and most sick birds undoubtedly recover spontaneously. The virus is passed from one bird generation to the next, thus perpetuating the reservoir. It is not known whether this familial propagation is accomplished by egg-borne infection or by direct passage from parent to baby in the nest. Certainly, most humans acquire their infection from parakeets, either by airborne dessicated bird droppings, handling sick or dead birds, or contact with nasal discharge, feathers, or excreta, as when cleaning the cage.³ The list of birds other than the parakeet which act as disease reservoirs include the cockatoo, cockateel, kea, lorikeet, lory, lovebird, macaw, and parrot; and among the non-psittacine birds, the pigeon, duck, chicken, turkey, finch, gull, pheasant,⁴ dove, canary, and fulmar.² There have also been documented instances of transmission from human to human,^{6,10} and Meyer and Eddie reported a case of a human carrier who harbored the virus for ten years.¹⁴

TABLE III. CLINICAL PSITTACOSIS

Case	Age	Sex	Source of Infection	WBC (1,000/cu.mm)	Area of Pneumonia
1. HK	57	M	Parakeet	5.9—17.4	RUL
2. LH	31	F	Parakeet	9.8	RUL
3. NG	60	M	Parakeet	5.4	RUL
4. WR	63	M	Duck, chicken pheasant	8.2	LL
5. GF	49	M	Parakeet	12.6	LING
6. DT	25	F	?	8.35	RLL
7. MD	54	M	?	9.9	Congest.
8. HM	47	M	Pheasant	9.7	LLL
9. LC	38	F	?	7.2	Bilat.
10. VS	19	F	Parakeet	5.5	RUL

One of the most interesting features of the transmission is the great variation of human susceptibility to the disease. Some patients acquire serious infections after only fleeting contact with the offending bird, while a member of the household who has been in prolonged and intimate contact with the same bird remains well, and may not even develop a significant antibody rise. However, the high incidence of complement-fixing antibodies in modest titres in the serum of bird-lovers suggests that subclinical infection is common.³

The serologic diagnosis of the disease merits special comment. First, the problem of cross-reaction with the virus of lymphogranuloma venereum is a problem in areas where the venereal infection is prevalent.¹ False positive reactions have also been seen in Q fever and brucellosis.^{5,10} In Case 1, a Q fever titre of 1:64 occurred as a cross-reaction to a psittacosis titre of 1:256. Because of the close antigenic relationship of psittacosis and lymphogranuloma viruses, and because of the prevalence of low titre antibodies in bird lovers, it is generally agreed that proof of clinical illness should rest on: (1) isolation of the virus during the acute illness (this has been accomplished from sputum, blood, and throat washings of human cases),¹⁰ or (2) a four-fold or greater increase in complement-fixing antibodies. Many authors, however, consider a titre of 1:32 in association with a typical clinical illness as ample presumptive proof of the disease. It should be noted that in our Case 2, positive proof of the disease was obtained by isolation of the virus from the family parakeet, even though the titre of antibodies never exceeded 1:32. Finally, it may be noted that a closely related virus causes sporadic encephalomyelitis in cattle.^{11,13} The patient in our Case 1 had a cow with antibodies against this virus. There is no evidence that cattle act as a reservoir of the disease in this country, however.

TABLE IV. CLINICAL PSITTACOSIS. RESULTS OF COMPLIMENT FIXATION TESTS AT INTERVALS AFTER ONSET OF ILLNESS

Case	Titre No. 1		Titre No. 2		Titre No. 3		Titre No. 4	
	Day	Titre	Day	Titre	Day	Titre	Day	Titre
1. HK	18	1:512	56	1:256	115	1:64	—	—
2. LH	1	Neg.	11	1:16	18	1:32	32	Neg.
3. NG	27	1:64	38	1:32	—	—	—	—
4. WR	24	1:128	45	1:128	—	—	—	—
5. GF	15	1:32	—	—	—	—	—	—
6. DT	20	1:512	26	1:512	250	1:8	—	—
7. MD	30	1:32	—	—	—	—	—	—
8. HM	30	1:64	36	1:32	—	—	—	—
9. LC	12	1:32	26	1:32	—	—	—	—
10. VS	17	1:64	21	1:64	—	—	—	—

TABLE V. RECOVERY OF VIRUS FROM BIRD

1. Saline suspension of ground bird spleen and liver
2. Inoculate mice
3. After 7 days, kill 2 mice and examine liver and spleen for exudate. If (+) grind organs and make suspension
4. Second passage intracerebrally and intraperitoneally. If virus present these mice become ill on 3rd or 4th day. They are killed and impression smears are made of spleen and brain
5. Machiavello's or Castaneda's stain examined for elementary bodies
6. Third passage is done if necessary

Since the antibody titre may not develop until ten to thirty-five days after the onset of the disease,⁸ one must decide on the basis of clinical grounds whether to treat the patient as psittacosis. This is an extremely important practical point, especially since there is evidence that the disease can be effectively treated by the tetracycline family of antibiotics. Tetracycline itself seems to be most effective,⁹ and since it appears that prompt therapy may actually suppress the development of antibodies,³ one may ruin his serologic diagnosis by his therapy. The serology of the reported cases is shown in Table IV. All cases included in this report had psittacosis CF titres of 1:32 or greater. The long persistence of antibodies despite adequate chemotherapy is illustrated by Case 1, whose titre was still positive 1:64, 115 days after the onset of the illness. On the other hand, the mild case of psittacosis in Case 2, which was promptly treated, produced only a transient rise of antibody titre which returned to negative thirty-two days after the onset of the disease.

Our group of cases supports the idea that tetracycline offers very effective therapy and is probably the drug of choice. Figure 1 illustrates the rapid lysis of fever by tetracycline (within three days) in two patients treated by this drug alone. It also shows the persistence of fever for five days in one case, despite adequate penicillin therapy, with prompt lysis when tetracycline was instituted.

What other means of proof of the disease exists? We would like to stress the usefulness of isolation of the virus from the parakeet. This is accomplished by injecting bird spleen hemogenate into the peritoneum of the white mouse followed by

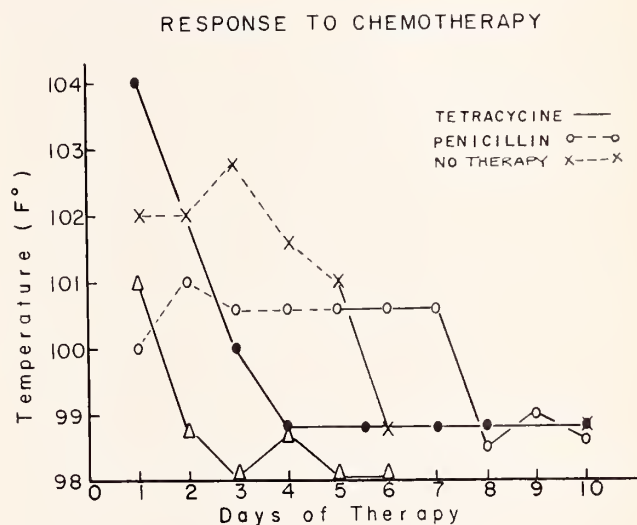


Fig. 1.

a second passage intracerebrally and thence demonstration of the elementary bodies (Table V). The Minnesota State Board of Health Laboratories accomplished this isolation in three of fifteen suspected parakeets during 1955.

Case Reports

Case 1. (UH #889177).—H. K., a fifty-seven-year-old white farmer became ill Sept. 22, 1955, with a "flu" syndrome followed in a week by dry cough, shaking chills and fever. The illness did not respond to penicillin and chest x-ray showed an atelectatic pneumonia in the right upper lobe. After eighteen days, bronchoscopy and a right bronchogram were done because of the suspicion of bronchogenic carcinoma, and he was referred to University Hospitals. Because of the atypical course of the infection, psittacosis complement fixation test was performed and was positive in a dilution of 1:512. The patient then recalled, on direct questioning, brief exposure to a cage of parakeets at a county fair about two weeks before he became ill.

This patient has had a severe and prolonged debilitating illness, which has now lasted six months, with evidence of liver damage (CCF 4+, serum A/G—3.1/3.8) and protracted weakness, malaise, diaphoresis and chronic cough. His titre was still positive in a dilution of 1:64 on the 110th day of the disease.

Case 2. (UH #800499).—L. H., a thirty-one-year-old white physician's wife became ill February 23, 1956, with shaking chills, temperature 105° F, a dry cough, headache, myalgia and right pleuritic chest pain. Chest x-ray showed a pneumonitis in the right upper lobe. Her husband had purchased a parakeet six weeks prior

to the illness as a birthday present for their daughter. The bird was always healthy, but the virus was recovered from this bird. The patient was treated with tetracycline and was afebrile in three days. She was well in one week. The maximum titre was 1:32 on March 9, and antibodies had disappeared by March 22, 1956.

Case 3. (UH #867819).—N. G., a sixty-year-old white milkman became ill in February, 1954, with the "flu" characterized by a dry cough, anorexia, temperature up to 102.4° F., and right lateral pleuritic chest pain. Chest x-ray showed pneumonitis in the right upper lobe. A history was obtained that he frequented a bar which contained a decorative cage of parakeets just above the patrons' heads. His psittacosis CF test was positive in a titre of 1:64 on March 12, 1954. Recovery occurred concomitant with tetracycline therapy.

Case 4. (UH #863721).—W. R., a sixty-three-year-old white man noted left pleuritic pain, October 15, 1953, associated with fever, nonproductive cough, malaise and arthralgia. Questioning about his occupation disclosed that he dressed rabbits, ducks, pheasants, chickens, geese and deer. He had cut his hands many times on sharp bones, and one cut on this thumb became badly infected and had to be "lanced" by a physician three days before he became ill. Axillary, inguinal and cervical lymph nodes were enlarged and tender, and a friction rub was heard over the left anterior hemithorax. The psittacosis CF test was positive at a dilution of 1:128. A roentgenogram showed pneumonia with atelectasis in the left lower lobe. The patient remained afebrile and symptoms abated over a six day period without therapy. He was lost to follow-up.

Case 5. (UH #893227).—G. F., a forty-nine-year-old white man became ill January 8, 1956, with headache, malaise, chills and minimal cough which was productive of small amounts of brownish sputum. He had bought a parakeet in December, 1955. Chest x-ray showed pneumonitis in the lingula of the left upper lobe. He became afebrile in twenty-four hours on tetracycline therapy and roentgenographic evidence of pneumonitis cleared within two weeks. The psittacosis CF test was positive at a dilution of 1:32.

Case 6. (UH #862838).—D. T., a twenty-five-year-old white woman noted fever and generalized arthralgia which was treated with aspirin with a clinical diagnosis of rheumatic fever in July, 1953. On August 23, 1953, she developed a temperature of 104° with inflammation of the right knee and ankle associated with cough, photophobia, "red spots" on legs and pain in the right upper anterior chest. The leukocyte count was 8,350 per cu. mm., and the cold agglutinin and C-reactive protein tests were negative. The muco protein measured 5.8 mg per cent. The psittacosis CF was positive at a dilution of 1:512 and the antistreptolysin-O titre was 400 Todd units. Chest roentgenogram showed pneumonitis in the right lower lobe. She was treated as having both rheumatic fever and psittacosis and made a slow recovery. No history of exposure to a parakeet was obtained.

Case 7. (#885644).—M. D., a fifty-four-year-old white man developed a temperature as high as 104° F., headache, weakness and malaise on June 6, 1955. He was treated with penicillin with some clinical response, but fever recurred on June 20, 1955. He was afebrile on admission on July 1, 1955. Chest roentgenogram showed only peribronchial "congestion" bilaterally. No bird history could be obtained. The psittacosis titre was positive at a dilution of 1:32.

Case 8. (UH #893357).—H. M., a forty-seven-year-old white man became ill on December 28, 1955, with a temperature of 101°, headache, malaise, cough and myalgia. He was not benefitted by penicillin, and a chest roentgenogram made January 2, 1956, showed pneumonitis with pleural reaction in the left mid-lung field. The psittacosis CF test was positive at a dilution of 1:64. After questioning, he recalled that his son had recently caught a pheasant in a trap and brought the bird home to keep in the basement. He had a good clinical response to treatment with tetracycline.

Case 9. (UH #891097).—L. C., a thirty-eight-year-old white woman was found acutely ill with a severe bilateral pneumonia November 18, 1955, associated with a temperature of 105° F and mental confusion. The fever responded somewhat to penicillin and streptomycin therapy. The cold agglutinin reaction was positive at a dilution of 1:28. The psittacosis CF was positive at a titre of 1:32. Serial chest roentgenograms showed gradual clearing of the bilateral fluffy pneumonia accompanied by lysis of the fever after tetracycline therapy was begun. No history of exposure to birds was obtained.

Case 10. (SHS #14330).—A nineteen-year-old white girl, V. S., complained of chills, fever, and headache December 10, 1955. Her illness was clinically diagnosed as "sinusitis" and she was treated with penicillin with some response. On February 3, 1956, she developed a nonproductive cough, malaise, chills and fever and recurrence of the frontal headache. Chest x-ray showed an "infiltrate" in the right upper lobe and the psittacosis complement fixation test was positive at a titre of 1:64. This patient was exposed to parakeets in South America six months before this illness and had a protracted "bronchitis" at that time. There was no known exposure to parakeets since.

Summary and Conclusions

The clinical aspects of infection with the psittacosis virus have been reviewed in the light of ten recent cases seen at the University of Minnesota Hospitals. This study emphasizes:

1. The sharply rising curve of incidence of this preventable disease concurrent with the unregulated shipment and sale of parakeets.
2. The extreme variability of both susceptibility to and infection with psittacosis virus, ranging

(Continued on Page 42)

Case Presentation

Acute Subdural Empyema of Otic Origin

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ACUTE subdural empyema arises from a fulminating intracranial infection and ends fatally unless it is recognized early and treated promptly by surgical means.¹⁻⁵ The infection frequently arises in the paranasal sinuses, whence it spreads through septic thrombophlebitis^{6,7} to involve the epidural space, and then by direct extension penetrates to the subdural space⁸ and spreads rapidly over the convexity of the hemisphere without entering the subarachnoid space.^{9,10} The subdural collection of pus may either localize over the hemispheric convexity or penetrate the interhemispheric fissure, or do both.¹¹ Since the introduction of antibiotics, the condition fortunately has become rare; but its clinical pattern is encountered frequently enough so that the possibility of subdural empyema must be considered whenever a patient with a history of ear, nose, or throat infection suddenly becomes critically ill.

The patients usually are young adults or adolescents. The causative organisms are commonly anaerobic Streptococci or Staphylococci. The source of the infection is most often a nasal sinus and on rare occasions, the ear.³ An instance of subdural empyema that affected a middle-aged woman and was produced by a pneumococcal infection from an otic source seemed unusual enough to justify the preparation of this report of diagnosis and treatment.

The classic pattern of subdural empyema begins with an infection of a nasal sinus or middle ear that may or may not have been adequately treated. After the infection has been quiescent for a period, the patient suddenly complains of headache, drowsiness, and stiff neck, evidences a cloudy sensorium, and lapses into semicoma. Lo-

calizing signs or the source of the infection may or may not be discoverable at this stage. The rapid deterioration of the patient's condition usually is evidence against a diagnosis of brain abscess. Within hours either Jacksonian or grand mal convulsions develop with hemiparesis of the extremities contralateral to the lesion. A pupil may become dilated and fixed. The patient suffers from fever, leukocytosis, and, if the lesion is on the left side, aphasia. A spinal tap will reveal increased pressure, increased concentration of protein, and pleocytosis to the extent of 1,000 to 2,500 cells (mostly polymorphonuclear leukocytes) per cubic millimeter of spinal fluid. The cell count is lower than in meningitis. The values for sugar and chlorides in the spinal fluid are generally within normal limits.

Because of the rapidly deepening coma, stiff neck, and convulsions, surgical treatment is necessary. Some physicians advocate multiple trephinations of the skull with aspiration of the fluid and irrigation of the subdural space,³ while others consider craniotomy more satisfactory.^{4,12} Antibiotics are given generously during the post-operative period, as well as anticonvulsants, if indicated.

Many patients recover with little neurologic sequelae, while others may have permanent defects of the visual fields, hemiparesis, and, with left-sided subdural lesions, varying degrees of sensory or motor aphasia. Recovery is dramatic, and is especially swift among younger patients.

Report of Case

A white, single woman, fifty-eight years old, was in apparent good health until mid-February, 1956. On the nineteenth, however, she called her physician to her home and stated that five days earlier she had begun to suffer from an ache in the left ear and mild fever. She had treated herself with aspirin and nose drops but had not obtained relief. The day before she consulted her physician the left ear had begun to drain purulent fluid. On the same day that she first consulted her physician she was admitted directly to a local

Read at the Southern Minnesota Medical Association, New Ulm, Minnesota, September 10, 1956.

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hospital because of nausea and vomiting which seemed to be projectile.

Physical examination at that time revealed a well-nourished, well-developed woman who was somewhat delirious and incoherent in her speech. She had con-

hours. Results of urinalysis were negative; the leukocyte count was 15,200 per cubic millimeter of blood, and the sedimentation rate 126 mm. per hour (Westergren method).

Shortly after admission to her local hospital, the

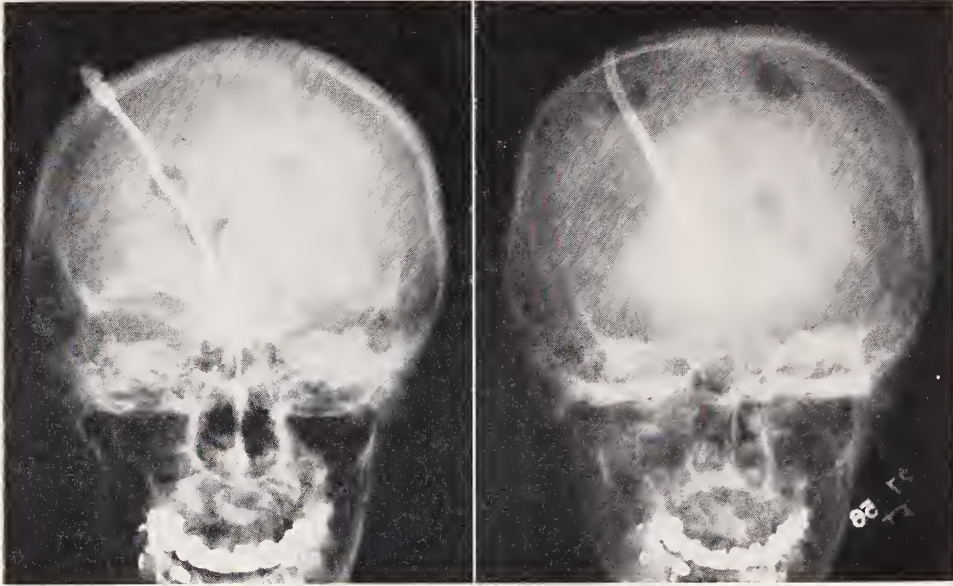


Fig. 1 (left). Posteroanterior ventriculogram showing shift of ventricular system from left to right. Air in subdural space on left.

Fig. 2 (right). Anteroposterior ventriculogram showing less displacement in posterior part of head by the mass on the left side.

siderable difficulty in completing a spoken sentence and had some loss of memory. The pupils were round and equal, and reacted to light and in accommodation. The nasopharynx was covered with a purulent exudate, under which the mucosa was red. Examination of the right ear disclosed nothing abnormal; the left aural canal was filled with bloodstained purulent material which came from a posterosuperior perforation in the drum. The mastoids were not swollen or tender, and the neck showed no rigidity. The blood pressure was 180 mm. of mercury systolic and 74 diastolic. Findings of the remainder of the physical examination and the neurologic examination were essentially negative. The patient's temperature on admission was 102.4° F.; by evening it had risen to 104.2°, and the following morning it was 103.2°.

At this point the consulting physician was asked to see the patient. He remarked the slurring of speech that had been noted the day before. Also, by this time definite ptosis of the left upper lid had developed, and the left pupil was dilated and did not respond to light or in accommodation. There was a rigidity, grade 4+ (on a grading basis of 1 to 4), of the neck. Hyperreflexia was generalized and Babinski's response was positive bilaterally. Spinal tap revealed that pressure had risen to 260 mm. of water, and the fluid was slightly cloudy with 1,300 leukocytes per cubic millimeter, of which 218 were lymphocytes. The value for total protein was 368 mg. per 100 cc., for chlorides 850 mg. and for sugar 180 mg. per 100 cc. Cultures of the spinal fluid showed no growth within forty-eight

patient was started on a course of 1,000,000 units of penicillin per day with 1 gm. of streptomycin four times a day; and treatment with sulfadiazine was initiated with a dose of 60 grains (4 gm.), and continued with doses of 15 grains (1 gm.) every 4 hours thereafter. Fluids were administered parenterally, and meperidine hydrochloride (Demerol) was given to control pain. By the fourth day of hospitalization, the patient had become lethargic but would respond to questioning. By the fifth day she appeared more alert and talked coherently. Nuchal rigidity was less. Cultures of the purulent material from the left aural canal disclosed *Staphylococcus albus*, and the sensitivity was highest to erythromycin; therefore, the patient was given 250 mg. of Ilotycin every four hours. Fluid from another spinal tap was similar to that obtained before, and revealed pneumococci on direct smear. The dose of penicillin was then increased to 1,000,000 units every four hours and the dose of Ilotycin to 500 mg. every four hours. By February 25 the patient seemed more lethargic and required constant nursing care because of right-sided Jacksonian seizures. A third spinal puncture revealed pressure of 580 mm. of water and cloudiness in the fluid. On the morning of February 26, the patient was found to have a flaccid paralysis of the right arm with generalized muscular twitching which was partially controlled by sedation. On the afternoon of that day she became comatose and was transferred to the Mayo Clinic with a tentative diagnosis of brain abscess.

When the patient was admitted to the hospital in Rochester she was found to have a temperature of

100° F., and a leukocyte count of 12,000 per cubic millimeter of blood. She was stuporous to comatose. Additional signs noted were stiffness, grade 4, of the neck, right hemiplegia with bilateral extensor plantar response of the lower extremities, and partial third

ment in moving the right half of the body, in taking nourishment and in carrying out the acts of elimination. She was finally dismissed from the clinic, April 3, 1956, and was cared for in a hospital near her home from April 3 to 20.

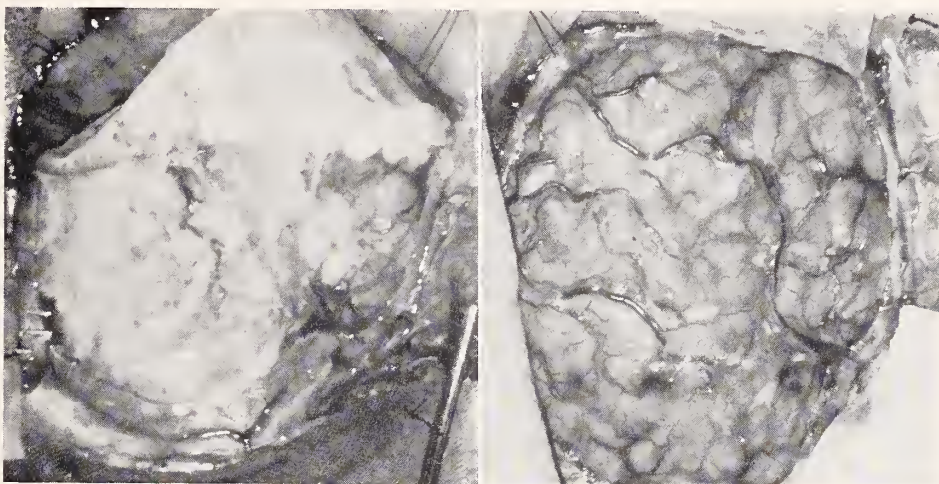


Fig. 3 (*left*). View at operation; pus was overlying brain in subdural space on left.
Fig. 4 (*right*). Left cerebral hemisphere after pus had been removed.

nerve palsy on the left. But there was no measurable papilledema, and the roentgenographic appearance of the skull was normal, with no pineal shadow. Embolic hemorrhages were noted in both eyes, which resembled those frequently seen in the fundi of patients with subacute bacterial endocarditis. Cultures of the blood made at the time of admission failed to grow any organisms, but a course of medication comprised of penicillin, erythromycin, dihydrostreptomycin and sulfadiazine was instituted immediately because pneumococci had been cultured from the spinal fluid previously. After a brief period of observation, a ventriculogram was made. It revealed a huge shift of the entire ventricular system from left to right caused by a left-sided frontoparietal space-occupying mass (Figs. 1 and 2). The fluid in the ventricles was slightly clouded and under marked pressure. Craniotomy was carried out immediately on February 27, and a huge membranous subdural empyema which covered the frontoparietotemporal area of the brain was encountered (Fig. 3). The subdural empyema was completely removed (Fig. 4); because of cerebral edema the bone flap was removed also, and because of the patient's critical condition an emergency tracheotomy was performed as well.

Postoperatively, the patient was given anticonvulsant medication, and the chemotherapeutic measures were maintained for ten days. Gradually but definitely her condition improved. By the tenth postoperative day, she began to respond to questions and commands, but then aphasia was noticeable. By this time, numerous cultures of the spinal fluid and of the empyemic fluid and membranes, as well as of the pus found at operation, indicated no growth of organisms. The tracheostoma was closed on the fifteenth postoperative day. The patient continued to show steady improve-

ment in moving the right half of the body, in taking nourishment and in carrying out the acts of elimination. She was finally dismissed from the clinic, April 3, 1956, and was cared for in a hospital near her home from April 3 to 20.

During this period of hospitalization the ptosis of the left upper lid began to lessen and she was beginning to perceive objects and record incidents about the hospital. On April 13 she had a grand mal seizure of a few minutes' duration. Administration of sodium dilantin was begun immediately. Since April 20 she has lived at home, and apparently has suffered only one minor convulsive episode.

The patient was readmitted to the clinic and hospital in Rochester for re-examination, July 21, 1956. She was found to be alert. Her primary neurologic deficit was a mixed type of aphasia. She did not seem to appreciate the right side of the body as well as the left, and there was mild hyperreflexia on the right, but the grasp and strength in the right upper extremity were better than when she had been dismissed from our care. No ptosis of the eyelid remained, the optic fundi appeared normal with no evidence of a homonymous field defect, and there was no papilledema.

According to her sister, the patient takes care of her various needs by herself. She turns on the radio and finds her desired station, she cooks her own meals, makes her bed, dresses herself and combs her hair. She does have considerable difficulty in expressing herself, but apparently she understands what she reads in newspapers and in magazine articles. Until May of this year she seemed to be improving considerably in understanding of speech and comprehension of reading and in speaking, but since that time little improvement has been noted. Because of the convulsive episodes the patient is being given diphenylhydantoin sodium (1 capsule three times a day) in the hope that this measure will prevent any such seizures in the future. If the patient makes sufficient progress and no complication develops, a cranioplastic procedure will be justified and indicated, especially if the convulsive episodes persist.

It has been noted that when the bone flap has had to be removed because of an infective process and cerebral edema, the spells are better controlled after cranioplasty. The decision will depend, of course, on the patient's progress and her desire to have the operation carried out for cosmetic reasons or to control the convulsions if they cannot be controlled by medication.

Summary and Comment

The case of a middle-aged patient in whom developed the signs and symptoms of increased intracranial pressure, secondary to otitis media, has been described. Instead of an intracerebral abscess, a huge subdural empyema was found covering the entire left cerebral hemisphere. This was totally removed at once. Because of excellent preoperative chemotherapeutic management of this patient, no positive cultures could be obtained at the time of operation or postoperatively. The clinical improvement was dramatic, and justified the radical surgical procedure which had been applied.

Acute subdural empyema is a surgical emergency. It is thought to be based on thrombophlebitis of the cortical veins which, if of sufficient magnitude, precludes a satisfactory postoperative recovery. Its presence must be suspected in any patient with a history of sinusitis or draining ear who suddenly becomes gravely ill, is semi-stuporous, and has Jacksonian convulsions. (Frequently the convulsive episodes affect the lower extremity contralateral to the lesion, or both lower extremities if there is an interhemispheric collection of pus.) After a careful assessment of the available clinical and laboratory findings in such an acutely ill patient, the differential diagnostic possibilities must be analyzed. In addition to subdural empyema these include bacterial leptomeningitis, extradural abscess, brain abscess, and thrombosis of the superior sagittal sinus.

The early recognition of subdural empyema as

a severe infectious process is essential so that the organism can be identified and its drug sensitivity tested at the earliest possible moment in order that the correct antibiotics may be administered. When the infectious process becomes localized either in the form of an abscess or empyema of the subdural space, definitive surgical measures can be carried out in the hope of salvaging a patient who appears critically, or even hopelessly, ill.

It goes without saying that the primary source of the infection must be sought out and treated surgically and with extensive use of antibiotics to prevent recurrent infection.

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(Continued from Page 14)

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The Management of Infectious Hepatitis

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A HOST of viral-induced illnesses still await the emergence of some antibiotic which will suppress them as penicillin does the pneumococcus and as streptomycin does the tubercle bacillus. In the absence of a specific effective drug, the management of hepatitis has necessarily been based on the supportive measures, i.e., rest and a nutritious diet. The parade of hopeful, frequently disappointing trials of therapeutic measures has included every type of intravenous infusion, numerous antibiotics, variously administered multi-vitamin preparations, salt-poor albumen, high doses of vitamin C, the sulfur-containing amino acids, and many kinds of diet. The typical story of initial success followed by failure to reproduce those results has attended almost every trial. It seems reasonable, then, to consider the evidence supporting what have been the foundation stones of the management of infectious hepatitis, rest and diet. Even these have been seriously questioned during the past few years. There is also some need to consider the current status of the adrenal steroid hormones in this disease.

Diet

During the past decade there has been some challenge of the validity of each element of what was formerly considered without question to be the proper diet in the management of hepatitis, i.e., the high calorie, high carbohydrate, high protein, low fat diet. The high incidence of the disease during the second World War was not only a stimulus to the intensive study of the disease, but it also afforded an excellent opportunity for such study. Thousands of servicemen with infectious hepatitis were often grouped together and studies in these groups led to some very interesting conclusions. Darmady¹ studied the effect in British servicemen of a high protein diet (CHO-370 gm.,

Prot. 155 gm., Fat 100 gm.) supplemented by vitamin B complex, as compared with the usual diet of the British army (CHO 320 gm., Prot. 80 gm., Fat 60 gm.). In a series of sixty-one patients, thirty-two of whom were on the special diet and twenty-nine on the standard, he found no advantage for either diet. Gertzen² divided 311 patients into three groups, keeping the basic diet identical for each group (CHO 320 gm., Prot. 80 gm., Fat 80 gm.) but adding 65 gm. of fat, 135 gm. of protein, and 100 gm. of carbohydrate, respectively, to each of the three groups. He, too, could detect no definite difference between any of the groups.

Barker, on the other hand, has been a proponent of the high calorie, high protein diet and strict bed rest. Along with his co-workers, he investigated seventy-six cases to test the variable of the high protein content of the diet.³ (Table I.)

TABLE I.

	Number Cases	Per cent Discharged, Improved*			
NUMBER OF DAYS HOSPITALIZED		42	56	70	84
High protein	30	13	40	50	53
Average protein	46	4	9	15	22

*Days after admission.

Their patients eating a high protein diet recovered and left the hospital significantly faster than those on an average protein diet.

Leone et al,⁴ working with sixty-seven volunteer prisoners whom they inoculated with infected pooled plasma or plasma from known carriers, found that the total serum bilirubin (TSB) in patients eating a high protein (200 gm.) high calorie (4000 cal.) diet stayed abnormal longer than the group taking *ad lib* diet (94 gm. Prot. 2600 calories). His treatment groups were small, however, limiting the significance of these results.

In the light of these divergent results, Chalmers, et al,⁵ undertook a study which was extremely well controlled and well analyzed. Two hundred

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and thirty-two patients, divided equally, were fed either a high protein, high calorie diet (215 gm. Prot., 4060 cal.) or an *ad lib* diet (130 gm. Prot., 3510 calories). The high-protein diet patients were tube fed if necessary to reach the level desired, and the necessity of the diet level was continually stressed to the patients. The other group ate as they pleased and the importance of the diet was never mentioned. The duration of illness in the first group was twenty-two days, the second twenty-eight days. This reduction (six days or 22 per cent) was statistically significant to 0.01 per cent. In a second study of 200 patients by the same investigators, the relative effects of the protein content and the total calories were investigated. Results are indicated in Table II.

TABLE II.

Number of calories.....	4000	3000		
Per cent protein in diet.....			19%	11%
Per cent reduction in duration of illness	6%		14%	
Statistical significance.....	Not signif. at 5% level		Signif. at 5% level	

Serum bilirubin also was found to fall significantly more rapidly in the forced diet group. It would appear then that the high protein diet is useful in the management of infectious hepatitis. Only in fulminating disease or severe hepatic insufficiency is the high protein diet not indicated.

The belief that low fat content in the diet benefits patients with hepatitis was influenced by many factors. As Hoagland stated, fat was first restricted because of the mistaken concept proposed by Virchow that the biliary radicals were obstructed by bile thrombi,⁶ thus excluding from the bowel bile necessary for the absorption of fat. This was later encouraged by the finding that degenerative hepatic changes were accelerated by fat in the diet of experimental animals.⁶ It has been observed, however, that for this to occur the protein content of the diet must be very low. This does not occur in man and a low fat diet has several disadvantages, among them unpalatability (which is distinctly disadvantageous in a patient already anorexic) and difficulty in attaining high caloric levels. Hoagland et al⁶ found that patients eating 150 gm. of fat daily did just as well as, and possibly better than, similar patients eating only 50 gm. of fat per day. They gained weight faster than the patients eating 50 gm. of fat per day. Wilson and his co-workers⁷ found in 103

cases that a diet high in fat inhibited in no way their progress toward recovery.

Lastly, with regard to the diet, it has been suggested^{8,9} that lipotropic agents, notably choline, cysteine, and methionine, have a distinctly beneficial effect in the jaundiced patient. In two well-controlled series,^{5,10} however, these agents were found to create no observable differences.

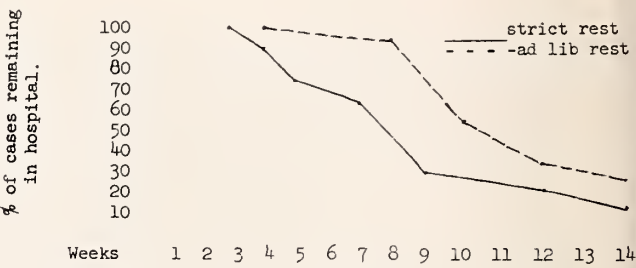


Fig. 1.

Rest

A need for complete rest was long considered essential in the management of hepatitis. Barker, who first described what he called a “new clinical entity—chronic hepatitis,” was the leading advocate of a strict bed rest regime. In a study with Capps,¹¹ he demonstrated that the patients on strict bed rest were discharged from the hospital earlier than those allowed activity about the ward. (Fig. 1.)

The patients on strict bed rest, however, were also fed a high protein-high calorie diet in contrast to the routine army hospital diet fed to the others. The possibility that this was the significant variable was not considered. Capps and Barker¹¹ stated that “failure to go to bed during the acute icteric stage has apparently caused cases of only moderate severity to progress to a fatal outcome over a period of weeks.”

Kunkel et al¹² stressed the need of following every patient with frequent bromsulphthalein (BSP) tests and advised reinstitution of bed rest if any elevation occurred. They described thirty-eight patients who “suffered relapses” during a “leave” when full activity was resumed for the first time. They defined “relapses,” however, as any elevation of the BSP above 5 per cent, whether attended by any symptoms or signs or not. This definition probably requires some modification. Kunkel and Labby¹³ reported five patients with cirrhosis following hepatitis, two of which were said to be related to increased activity (wartime duties) during the acute illness.

The concept of rest in hepatitis seems reasonable and had been accepted without question until 1949 when Gardner et al¹⁴ examined sixty-eight servicemen who had had hepatitis six months to one year previously. He could find no relation between the degree of interim activity and the residual physical signs, symptoms or laboratory abnormalities of infectious hepatitis. Nelson and his co-workers¹⁵ examined seventy-nine patients who had done full-time duty between discharge from the hospital and follow-up. Mild symptoms of fatigue, anorexia, or upper abdominal pain were frequent (twenty-two of seventy-nine) but only six had any abnormal test of liver function and these abnormalities were slight. Only four patients had a combination of abnormal symptoms, signs and laboratory findings. All of these were mild. On discharge from the hospital, there had been a total of sixty-seven abnormal tests of liver function. On follow-up there were only twenty-eight. Abnormalities of both total and direct serum bilirubin (SB) decreased in incidence following discharge. However, BSP retention increased in incidence. From these data the authors concluded "that activity far in excess of that usually prescribed in acute hepatitis did not inhibit sustained recovery."

Swift et al¹⁶ divided ninety-eight patients into three groups during convalescence, one having graduated exercises requiring progressively greater effort, one on bed rest without exercise, and one group on fatiguing exercises from the outset. Convalescence proceeded at the same rate in all groups. Only when the direct serum bilirubin exceeded 3.0 mgm. per cent did exercise prolong the time for recovery.

Some¹⁴ have suggested that the reason for the more frequent relapses after resumption of activity in Barker and Capps' cases, compared to the studies mentioned above, was that the former were more fatigued from combat conditions and more poorly nourished prior to the onset of their disease. McFarlan,¹⁷ studying troop activities in New Zealand, North Africa, Sicily and Italy in relation to epidemics of infectious hepatitis in these areas, concluded that neither physical strain nor dietary deficiency were precipitating factors. Retrospective analysis of the data of Chalmers et al⁵ also revealed no such relationship. The latter study provided remarkable evidence that rest may not be an essential component in the treatment of this disease. Two hundred thirty-two patients were divided equally and placed on either a strict bed

rest or "ad lib" rest program. Those on strict rest were allowed one latrine visit per day, two showers per week, all other activity including meals being restricted to bed. Co-operation was carefully recorded, statistically evaluated and was found to be excellent. The ad lib rest patients were free to move about the ward at will. By the seventh day more than half of them were out of bed more than half the day. The two groups were vastly different in their level of activity. If duration of illness was defined as the first normal BSP (less than 5 per cent) combined with two consecutive normal total serum bilirubin (less than 1.5 mgm. per cent) determinations, then the average response to rest was a 10 per cent or three day reduction (twenty-seven to twenty-four days) in duration of illness in favor of the *ad lib* rest program. This, though, statistically significant to 5 per cent, was not significant if duration of illness was defined in some other way. Nowhere in this study, however, were the patients forced into activity. When they felt sick they were allowed to lie in bed, so that this study offers no evidence that rest is *not* advantageous when the patient feels sick. "It is still probable that enforced activity during the acute phase of hepatitis, as in any infectious disease, will make the patient feel worse, and may possibly prolong the disease."⁵ The *ad lib* rest program also has two distinct advantages. It removes a considerable fraction of the burden of patient care and it obviates that period of recuperation after any period of prolonged bed rest. One-half of the patients in this latter study were also started on strenuous physical reconditioning as soon as their laboratory values had returned to normal. This included various calisthenics and exercises, marches, long and short drill work, and organized athletics. It is of interest that a significant number of minor abnormalities developed in this group and also that these same abnormalities disappeared while they still participated in the exercise program. They were thus considered to be of little clinical importance. In only 4 per cent of the patients did either abnormal BSP retention or SB elevation develop. These, too, returned to normal while still on exercise.

Adrenal Steroid Hormones

The use of these substances was met at first with considerable enthusiasm, but it soon became apparent that one had to choose between what seemed to be a fair therapeutic response and the

complications associated with steroid therapy. One of the first reports was that of Sborov¹⁸ who treated fourteen patients with a single dose of ACTH daily, administered either subcutaneously or intravenously for ten days starting in the first week of illness. In the treated cases the mean SB dropped to normal in twenty-seven days; in eighteen control patients, it remained abnormal for fifty days. He stated that "in no instance did the ACTH adversely affect the course of hepatitis." Colbert et al¹⁹ were not so fortunate. In five patients treated with ACTH they obtained a "most striking result." The appetite and energy returned promptly and the SB showed a prompt fall in all cases, but the relapse in two of the five was worse than the original illness. "Untoward effects, including ascites, sacral edema, moon face, acne and hypertension, were noted in all five patients, and joint pains developed in four of the five patients upon withdrawal of the ACTH."

Evans et al²⁰ treated twenty patients with ACTH. No effect was noted in either BSP or SB lowering except for a prompt initial fall in SB. A "dramatic effect of improved sense of well being and an increased and often insatiable appetite" was observed. Four relapses occurred in these twenty patients compared to an incidence of relapse of less than 1 per cent in previously treated cases. Using cortisone²⁵ they noted a significantly more rapid fall of SB and BSP, but again relapses were noted in two out of ten cases. It was postulated that starting these drugs too early in the course of the disease or discontinuing them prematurely²⁶ may have been responsible for the relapses,²⁰ but further experience has not borne this out.

In the largest study reported to date, Sborov and co-workers²¹ treated forty-nine patients with varying doses and modes of administration of ACTH. He concluded that the duration of abnormal liver function tests grew shorter as more sustained adrenal stimulus was attained and that a definite therapeutic effect in cholangiolitic hepatitis was noted, but that no statistical difference between treated patients and controls was shown. Needle biopsy in all patients likewise showed no clearcut differences. The results obtained by Johnson and Bennett²² in twenty-two patients were similar to those of Sborov. He noted, in addition, complications of perforated ulcer, marked euphoria, rounding of the face and aggravation of a case of diabetes. The complications assume smaller pro-

portions, however, in cases of severe infectious hepatitis. Rifkin et al²³ reported four patients with homologous serum jaundice "going rapidly downhill" on routine therapy. A "remarkable clinical change following administration of corticotropin" was noted in each case. Evans et al²⁴ treated five patients with "severe (SB over 15 mg. per cent) hepatitis and observed a "consistent and rapid decrease in bilirubinemia and the relief of symptoms." Three of the five relapsed, however, to lesser degrees of chemical and symptomatic abnormality. Six cases described as "fulminant" all died in spite of treatment with ACTH. One must then choose in the routine case between the possibility of complications and the potential of benefit to the patient. The validity of using these drugs to increase appetite with consequent nutritional benefit needs further investigation. Their use in severe progressive or persistent disease is probably also indicated, but the utilization of these products in the routine case is questionable. There have been few well-controlled reports on their use. Further study is needed, but it appears that in the usual instance of uncomplicated infectious hepatitis the complications of steroid therapy and the associated incidence of relapse outweigh its possible benefits.

Relation of Treatment to Residual and Development of Cirrhosis

There remains one question which will certainly be answered with great difficulty. Does the type of treatment alter in any way the development of persistent hepatic insufficiency or predispose to the future occurrence of cirrhosis? The development or persistence of residual abnormalities following viral hepatitis has been studied repeatedly. Klatskin and Rappaport²⁷ examined 217 post-hepatitis patients, and found that 108 (50 per cent) had either symptoms referable to the liver, hepatomegaly or evidence of impaired liver function. The duration and severity of the jaundice appeared to be the only factors which bore any relation to the incidence of residuals. There was "no significant difference between those who had been kept in bed for the entire duration of the jaundice or longer, and those who had had bed rest for less than the duration of the jaundice." Post et al²⁸ found that forty-four of 117 patients had developed residuals. In five these were attributed to too short hospitalization. Kunkel and Labby¹³ described two patients who relapsed on

return to wartime activities who now have persistent elevation of BSP retention and hepatic tenderness. Chalmers et al⁵ felt that "chronic hepatitis" had developed in four patients but no effect of previous treatment could be ascertained. He stated that the "incidence of chronic disability and significant residual abnormalities observed in follow-up was no greater for patients permitted ad lib ambulation and started on strenuous exercise early than for those on the conventional treatment regimen." Nor is hepatic disturbance in the post-hepatitis patient evidence of causal relationship.²⁹

To answer the question, one must first determine what is significantly abnormal. In patients with abnormal symptoms or signs relative to the liver but with an histologically normal liver, which is of greater significance? It has been demonstrated that biopsy specimens are correlated poorly with clinical data. One must be aware of a number of factors other than the variables in treatment. For instance, one must differentiate infectious hepatitis and serum hepatitis, and also take into account the wide natural variation of the disease, the other possible sources of hepatic injury, the differences in virus type and constitutional differences in the host. Zieve has also shown that the incidence of significant residual abnormalities is small and the collection of a numerically adequate sample would indeed be difficult.³⁰ The demonstration of a relationship between treatment factors and residual abnormalities would be extremely valuable.

Summary

1. A high protein diet is of significant value in the management of infectious hepatitis, except where a severe degree of hepatic insufficiency is present.

2. A low fat diet is neither necessary nor desirable.

3. The lipotropic substances have made no significant difference in the course of the disease.

4. Strict bed rest is probably not necessary although strenuous activity during the acute stage of the illness is to be avoided.

5. The degree of activity during convalescence has no effect on the incidence of residual abnormalities.

6. ACTH and cortisone are probably better reserved for severe cases and excluded from the

management of the routine case, but further work is needed on this point.

7. The incidence of residual abnormalities following infectious hepatitis is probably low.

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(Continued on Page 74)

Continuation Study

Neurosurgical Aspects of Brain Abscess

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BRAIN abscesses most often develop from middle ear and paranasal sinus infections, or they are metastases from pulmonary infections. They may also result from implantation in penetration head injuries.

Mode of Spread of Infection

Infection from otitic and paranasal sinus lesions spreads to form a brain abscess either by direct extension or by retrograde flow or thrombosis in veins. The veins are without valves in this region. Middle ear infections perforate through the tegmen tympani into the temporal lobe. The less frequent infections of the inner ear perforate through the posterior surface of the petrous pyramid to form cerebellar abscesses below the tentorium.

Frontal sinus infections may spread through the posterior wall of the frontal sinus and across the subarachnoid space into the frontal lobe or they may produce a spreading osteomyelitis of the frontal bone and this infection extends across the subarachnoid space into the frontal lobe, or it may pass across the subarachnoid space by retrograde flow or thrombosis in veins to the frontal lobe.

In penetrating head injuries, embedded pieces of bone or hair or other foreign material are very prone to produce an abscess. Hence, such wounds should be immediately debrided. Small metallic bodies are not equally infectious and, if deeply embedded so that removal may result in extensive brain destruction, they are best left undisturbed. Even in these instances an abscess may later form around the foreign body, sometimes many years after injury. Brain abscess is a common complication of congenital heart disease.

Pathologic Changes

Brain abscess as a rule develops subcortically in the white matter where the blood supply is less abundant. It begins as an area of encephalitis

with a necrotizing center surrounded by a poorly defined inflammatory zone. Eventually a capsule is formed. Abscesses continue to enlarge by thrombosis of blood vessels and necrosis of tissue. This enlargement occurs most frequently adjacent to the ventricles, so that the abscess is prone eventually to rupture into a ventricle rather than into the subarachnoid space.

Metastatic abscesses are usually multiple, and those from pulmonary infections contain anaerobic organisms and often are not capsulated. They were almost uniformly fatal before the advent of chemotherapy.

The subdural space, between the dura and arachnoid, is a very narrow space more potential than real. By retrograde thrombosis or perivascular spread of infection, this space may become infected and the limitation of such an infection then is similar to the localization of a pleurisy or empyema of the thorax, that is by adhesive inflammation to seal the arachnoid to the dura. The most fulminating subdural abscesses result from frontal sinus infections. They tend to spread posteriorly, either along the falx or over the cerebral convexity and may even extend through the tentorial notch into the posterior fossa. More will be said about subdural abscesses below.

Diagnosis

Brain abscess is often a treacherous lesion difficult to diagnose. Awareness of the possibility of a brain abscess is most important in its diagnosis. Rarely is it evident that the patient has a brain abscess when first seen by the neurologist or neurosurgeon. Often meningeal signs are the predominant feature and it is difficult to decide whether the patient merely has meningitis or an abscess with associated meningitis. Localizing signs, if present, suggest an associated abscess.

On the other hand, brain abscess may be so latent in onset that the primary infection is no longer a prominent feature. A very chronic brain abscess may be associated with minimal or no

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signs of infection and present only the signs of an expanding lesion. This is especially true when a capsule has developed. As a capsule develops, all signs and symptoms may subside, especially the signs of infection, such as temperature, leukocytosis and meningeal irritation; the patient becomes more alert and headache disappears.

The symptoms of an abscess are due to a space-displacing lesion, tissue destruction and an infectious process with reaction to the infection. It has been said that the only symptom never absent in brain abscess is headache. Papilledema is present in approximately two-thirds of the cerebral and in one-third of the cerebellar abscesses. Brain abscesses may or may not have localizing signs. Seizures occur in about the same frequency that they occur in brain tumor, i.e. in about one-fourth of all cases. When a brain abscess is suspected, its presence and location are verified by ventriculogram or angiogram.

Since about 1925, when the treatment of brain abscess shifted to the care of the neurosurgeon, many factors have contributed to improved results, especially improved diagnostic procedures such as air injection (usually ventriculography), angiography, a better understanding of increased intracranial pressure and its management, and more recently chemotherapy and antibiotic therapy.

Some of the methods of treating brain abscesses that have been employed by neurosurgeons are:

1. Unroofing the abscess by removing the overlying bone, dura and cortex to allow the abscess to herniate to the surface (King, 1924).
2. Aspiration of the abscess without drainage (Dandy, 1926).
3. The insertion of a tube into the abscess for continued drainage, and recently this has been combined with periodic instillation of antibiotics through the tube.
4. Total extirpation of the abscess (Vincent, 1936).

Present day surgical treatment of brain abscesses is varied to suit each case, one or other or a combination of the above procedures being used. There are three objectives to be attained in the treatment of a brain abscess, i.e., to save life, preserve or restore function, and avoid sequellae, especially epilepsy.

Abscesses from paranasal sinuses may be treated

by aspiration only, tube drainage or excision. The recent trend is to aspirate the abscesses until they become encapsulated and then excise them. When aspirated, thorotrast may be injected. It is phagocytosed by the wall of the abscess and then by x-ray the size and location of the abscess may be followed. Excision of an abscess in the fulminating stage before capsule formation is done only under duress, when the abscess cannot be otherwise controlled, and excision is necessary to save life regardless of the extent of loss of function.

Abscess from penetrating wounds, such as war wounds, requires, as a rule, early operation with excision of the abscess and debridement of the area as soon as the abscess is recognized.

Metastatic abscesses, even when single, as they are in 40 per cent of cases, tend to be more malignant, rapidly progressive and nonencapsulated because of the debilitated condition and low resistance of the patient, and because they are most often caused by an anaerobic organism from a pulmonary lesion. Multiple metastatic brain abscesses are still rarely cured.

Mortality

In a recent report¹ the mortality rate is given on 295 patients. The mortality for those treated before the use of penicillin was 53 per cent, in contrast to a 27 per cent mortality for those treated with penicillin. The greatest reduction in mortality was in patients with cerebellar abscesses, where it was reduced from 70 per cent to 9 per cent, and in patients with cerebral abscesses secondary to bronchogenic abscesses, where it was reduced from 100 per cent to 32 per cent. In other cerebral abscesses, mortality was reduced only from 36 per cent to 30 per cent.

Sequellae

Of 175 patients followed¹ 8 per cent were disabled by profound, motor sensory or visual defects. Another 8 per cent had slight defects, and 84 per cent had no significant defect.

When the capsule is not excised, there is often recurrence at the same site (seven recurrences in 88 cases¹). With excision of the capsule, there is seldom late recurrence. Epilepsy, present in 27 per cent of patients with cerebral abscesses before operation, was present in 47 per cent of the survivors.¹ That is about the same incidence of epilepsy that occurs after penetrating missile

wounds of the brain. Removal or nonremoval of the capsule does not seem to affect the incidence of epilepsy after brain abscess. The first seizure appears within one year after treatment of brain abscess in about two thirds of those developing epilepsy, but it has first appeared as late as fourteen years. Every patient recovering from brain abscess should be put on anticonvulsive drugs and kept on them indefinitely; if not, status epilepticus may suddenly develop and the patient may die in the attack.

Subdural Abscess

Subdural abscesses, as stated above, occur between the dura and arachnoid. They are quite rare. They arise from otic infections or from virulent frontal sinus infections. Those from frontal sinusitis are prone to be very acute and fulminating, spreading rapidly over the medial side of the hemisphere along the falx or more lateral over the convexity of the hemisphere. Before the use of antibiotics, they were almost uniformly fatal in this early spreading stage even before the diagnosis was made.

These patients are bedridden and the infection

spreads by gravity in a posterior direction. If it spreads along the midline, it produces focal Jacksonian seizures in the leg, with paralysis and sensory disturbances in the leg and, as it extends still further posteriorly along the midline, it produces a homonymous visual field defect. If it spreads more lateral over the convexity of the hemisphere instead of along the falx it produces focal seizures in the arm and face, aphasia and paralysis or conjugate deviation of the eyes toward the side of the lesion.

Before the employment of antibiotic therapy these subdural infections were almost uniformly fatal, but now they tend to become chronic with localized collections of pus and survival is possible with early and adequate drainage. They are best treated by multiple trephine drainage openings made at the site indicated by the clinical findings or it may be necessary to use ventriculography to locate collections of pus.

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PSITTACOSIS IN MINNESOTA

(Continued from Page 30)

from subclinical infections to a protracted and debilitating disease.

3. That therapy with tetracycline seems to be effective, but that one cannot delay therapy until the diagnosis is established serologically, since the appearance of antibodies may occur late in the illness.

4. In selected instances, the recovery of the virus from the parakeet by mouse inoculation may prove to be the most direct and expedient means of establishing the diagnosis.

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Tumor Conference

Section Editor

CLAUDE HITCHCOCK, M.D.

BRONCHOGENIC CARCINOMA

Case Study, Minneapolis Veterans Hospital

Presenting complaint: Fever, cough and wheeze, developing during hospitalization for treatment of a gastric ulcer.

A white man, sixty-one years old, was admitted to the hospital with a twelve-year history of epigastric pains, and a diagnosis of peptic ulcer established previously. The ulcer was in the pylorus and failed to show x-ray improvement after two weeks of intensive treatment; surgery was advised. Chest x-ray was negative. There was a history of mild chronic cough and occasional wheezing, with dyspnea on slight exertion thought to be due to chronic bronchitis and emphysema. Operation for ulcer was scheduled on the thirty-second hospital day.

On the day prior to scheduled surgery a fever of 102° was noted, with wheezing and signs of consolidation in the left lower lobe. There was no antecedent respiratory infection. The operation was canceled, and a diagnosis of pneumonia was considered on the basis of chest x-ray findings. The possibility of bronchogenic tumor was considered but bronchoscopy was delayed for three weeks during a trial of antibiotic therapy. The lung lesion did not disappear.

Bronchoscopy revealed a tumor nearly occluding the left main bronchus, 2.5 cm. from the carina. Biopsy showed squamous cell carcinoma. Inspiration-expiration films indicated that there was exchange of air on the left, though auscultation suggested exchange was limited.

The patient had a vital capacity of 1.8 liters exhaled slowly, and was dyspneic on slight exertion, such as walking down the hall. For these reasons several of the staff felt that operation could not be tolerated. Others thought that the left lung was largely functionless, and that there was a reasonable chance that surgery would be successful.

The latter view prevailed, and a radical pneumonectomy was performed thirty-eight days after the initial febrile episode. The tumor was localized in the left main bronchus, which was now completely obstructed, and twelve nodes sectioned were negative. The patient recovered uneventfully and was less dyspneic on walking the halls after surgery than he was before. With nodes being negative, he has a reasonable chance for cure. Operation for the pyloric ulcer will be carried out later if needed.

Comment: This case illustrates the difficulty of making an early diagnosis of bronchogenic carcinoma. The findings developed while the patient was in the hospital, yet operation was delayed five weeks more than it would have been if a complete study had been done immediately.

This patient also furnishes a lesson in judging operability of pulmonary lesions. If the lung to be resected is largely nonfunctioning, operation may be successfully carried out in spite of a small respiratory reserve.

"SECOND LOOK" SUCCESS

Case Study, Minneapolis Veterans Hospital

Presenting complaint: Crampy abdominal pain, beginning three years before first admission.

The patient, a white man, thirty-six years old, was first admitted to his local hospital in January, 1952. His abdominal pains had become progressively worse and had been most pronounced after ingestion of food. He also had anorexia, occasional vomiting, and had lost thirty pounds during the preceding year. He was operated upon in his own community and found to have an adenocarcinoma of the terminal ileum, with attachment to the right side of the bladder. The tumor and twelve inches of ileum were resected. Pathologic sections were reviewed at the Veterans Hospital and the diagnosis was confirmed.

The patient was referred to the Minneapolis Veterans Hospital in February, 1952, for possible roentgen therapy to the operative area. Examination showed an emaciated patient with a well-healed abdominal wound. X-ray studies disclosed two stones in the right renal pelvis. Cystoscopy was negative. Barium enema showed irregularity in the terminal ileum. It was decided to re-explore the abdomen; two months having elapsed since the initial operation.

A nodule of adenocarcinoma 2x2 cm. was found attached to the serosa of the bladder, and several large nodes were present in the mesentery of the terminal ileum near the previous anastomosis. The nodule was removed from the bladder by cutting down to, but not through, the mucosa. Resection of 62 cm. of ileum and 19 cm. of ascending colon, with attached mesentery, was carried out. No tumor was found in the bowel or nodes.

The patient recovered and went home, but returned seven months later because of severe right costovertebral angle pain. Retrograde pyelograms showed obstruction at the right ureteropelvic junction. At exploration of the abdomen, a 1.5 cm. nodule was found in the peritoneum on the right side of the bladder. It was pedunculated and easily excised. The right ureteropelvic junction was also explored, and a 2x3 mm. stone was removed. This finding, rather than the metastatic tumor, probably explained the patient's symptoms on this admission. The patient recovered uneventfully and went home, where he regained his normal weight. He had no symptoms, but was advised to have an exploratory operation for possible recurrent cancer. This was performed eight and one-half months after the preceding operation. Many small nodules were excised and sectioned. All except one were granulomas, but a 1 cm. lymph node in the sigmoid mesentery contained adenocarcinoma.

The patient went home and was symptom-free. He returned for his fourth surgical look five months later, which was entirely negative. He required another operation eleven days after this for lysis of adhesions which were causing small bowel obstruction. Since then he has done well. He was last seen thirty-two months after the last procedure, or four years and eight months after the first operation, and will continue to be followed.

Comment: This case illustrates an apparent success with the "second look" procedure for cancer. Four operations were done in the absence of symptoms which could be attributed to residual cancer, and small metastases were found at the first three. Cure of this patient is possible, though of course, not certain. In any event the patient is surely better off than he would have been if the metastases, which were found by virtue of their appreciable rate of growth, had not been removed.

PAROTID CARCINOMA?

Case Study, St. Barnabas Hospital

During March, 1956, a healthy woman, sixty-seven years old, was admitted to St. Barnabas Hospital with a history of a gradually appearing painless lump below the lobe of the right ear and posterior to the angle of the right jaw. This mass had made its first appearance approximately six months prior to the time of admission.

The patient was operated upon under general anesthesia for local excision biopsy of the tumor and the mass was found to be attached to, but not considered as a definite part of, the tail of the parotid gland. A wide removal of the local lesion was performed including normal appearing surrounding tissue. The frozen section diagnosis reported probable metastatic carcinoma probably of the squamous type. No further surgery was performed until a further searching examination of the nose, throat, and adjacent areas had been made.

The paraffin-stained sections revealed the tumor to be a muco-epidermoid carcinoma of an "intermediate grade of malignancy," but there was some difference of opinion among various pathologists as to the classification of this degree of malignancy. The patient was operated upon following the recommendations from the St. Barnabas Tumor Conference, and a total parotidectomy was performed with an in-continuity neck dissection on the involved side, and with preservation of the facial nerve. The consensus of the Tumor Conference was that, since this lesion was not a definitely high grade type of invasive cancer, and furthermore, since it was located in its parent origin at the very lower portion of the parotid gland, it would be reasonable to preserve the nerve.

The patient recovered without event from the
(Continued on Page 70)

Editorials

JOHN F. BRIGGS, M.D.
ARTHUR H. WELLS, M.D.
HENRY G. MOEHRING, M.D.

THE PSYCHO-EDUCATIONAL CLINIC

The Psycho-Educational Clinic is a department of the College of Education, University of Minnesota. It offers diagnostic and remedial services to children who have encountered special difficulties in school learning. Beginning in the Fall of 1956, the Clinic will expand its services to include diagnosis and counseling in the areas of special education (handicapped and gifted children) and educational and vocational guidance for teenagers. In conjunction with this service, the Clinic has training and research programs.

The staff of the Clinic consists of the five regular faculty members of the University who carry part-time assignments in the Clinic, four graduate student clinicians, and a secretary. Some graduate students also participate directly in the activities of the Clinic under supervision of the Clinic staff. The training of all staff and students is in the area of educational psychology and closely allied disciplines. There is *no representation* of the fields of medicine, psychiatry, social work or speech pathology on the staff.

The most common referral concerns reading difficulty. Referrals for reason of poor progress in other basic school subjects (arithmetic, spelling, handwriting, et cetera) are less common. Other common bases for requesting Clinic services include school readiness problems and special abilities and talents. The Clinic also offers limited services in the case of mentally and physically handicapped children. Age limits are from five (school readiness) through eighteen (high school).

The first step in making a referral to the Clinic is simply to call or write to the Clinic asking for referral forms. Usually the parents or school officials make this first contact. When the referral forms have been completed and returned to the Clinic, they are studied, and if it appears that the Clinic is an appropriate diagnostic agency, the parents are contacted by phone or letter to arrange specific appointment dates. Referral procedure is modified in the case of referrals by physicians, social workers, welfare agencies, and others. In every case, however, it is required that the parents and a professional person (usually school

officials) agree to and participate in the referral.

Typically, a diagnostic study will take about three half-day appointments. The Clinic attempts to collect information about the child, his family, community and school in order to offer insights as to the nature of the problem and suggestions for rehabilitation. A typical study would include: (1) a parent interview; (2) individual mental testing; (3) screening tests for possible vision and hearing difficulties; (4) personality evaluation (including tests, observation and interviews); (5) survey testing in basic school subjects; (6) detailed diagnostic testing and evaluation in the areas of the difficulty; (7) a final parent interview; (8) a full report of findings, interpretations and recommendations to the referring agency or person (usually school officials). No written reports on diagnoses are given to parents, but major results are summarized in the final interview. The fee for the educational diagnosis described above is \$30.00. In cases requiring less than three half-days, the charge is at the rate of \$3.50 per hour. A limited scholarship aid, provided through the Greater University Fund, is available to those unable to pay the full fee.

The Clinic offers remedial services only after a diagnosis has been completed and then only in cases where its facilities seem definitely suited to the needs of the child. Remedial tutoring in reading is the most frequent service rendered. All remedial services are on a highly individualized basis. During the school year, a limited number of children can be served. Each child comes to the Clinic for the period from 9:30 to 11:30 a.m. each school day. During the Summer, a ten-week Remedial Reading School is in operation. This program begins in mid-June and ends in late August. Children attend five days a week from 9:00 to 11:00 a.m. Fees are charged for remedial tutoring at the rate of approximately \$3.00 per day.

The Clinic operates five days a week through the entire year, except for the month of September and during school holiday periods (Christmas, New Year's Day, et cetera).

MAYNARD C. REYNOLDS
University of Minnesota

ADVERTISEMENTS?

A Yale Ph.D. (English literature), stationed in the Aleutians, once told us that somehow the overseas editions of the *New Yorker* (for example) didn't hit the mark. His idea of luxury, he declared, was *not* to sit down and read such issues emasculated by removal of all the advertisements, but rather to sit comfortably and read the full-fledged magazine so he could day dream through the ads and savor the high standard of living to which they always beckoned him. We don't put MINNESOTA MEDICINE in the same class with the *New Yorker*, but we submit that the sage observation by our erudite friend is as true for this magazine as for any lay periodical.

An occasional ruffle on our quiet editorial waters signifies someone's conviction that the advertisements in MINNESOTA MEDICINE are just so many pages thrown away. With that someone, we disagree.

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H.G.M.

BLUE SHIELD AND THE ECONOMICS OF MEDICINE

Why should any doctor take a special interest in his Blue Shield Plan?

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Blue Shield has grown into a big business, in terms of the 37 million people enrolled and the more than \$350 millions now paid each year in medical benefits by the Plans. But Blue Shield is big only because the medical profession has fashioned a big instrument to do a big job—and the public has given Blue Shield a big reception!

PROFESSIONAL RELATIONS COMMITTEE

Blue Shield Medical Care Plans

Chicago, Illinois

ENGRAVING—POINTS TO REMEMBER

When ordering engravings, it is well to keep in mind that there are certain things to specify in order to insure obtaining the best results in printing.

— This is the fourth and final editorial in a series on the subject of photo engraving.

1. Be sure the engraver proofs your work on the paper that will be used in the final printed job.
2. If the work is in more than one color, be sure that color bars are proofed with the job in the direction of inking. This will determine the quantity of ink used on the proof.
3. The engraver should use inks supplied or specified by the printer. This will insure the same result that the printer will obtain when printing.
4. In a job of more than one color, the proof should be printed in the same rotation as the printer will follow.
5. The proof should be printed with no make-ready. This will show the true value of the plate.
6. Whenever possible, the work should be proofed on the same stock as the printer will use. With the same inks, rotation of colors, and identical stock, you are insuring yourself against disappointments.

There are many terms in common usage in the graphic arts' industry that are sometimes unfamiliar—perhaps a brief reference to them will be helpful.

Backing up—Metal backing soldered to plates—generally to make them 11 points thick for printing or making pattern plates.

Base—Wood or metal upon which plates are mounted.

Bearers—In photoengraving—the dead metal left on a plate to protect the printing surface during electrotyping.

Ben Day—A method of laying a tint or screen (dots or lines) to obtain tones or shadings of color off the solid color.

Bleed—An illustration that extends to one or more edges of a printed page.

Blowup—As term implies—an enlargement from original size.

Burr—Metal turned up above printing surface by routing machine.

Combination plate—Halftone and line work combined on one plate by stripping the negatives together as one—and then etching for depth for both line and halftone.

Drop out—A halftone having no halftone screen in the highlights.

Flush blocking—Trimming printing plate so that plate and block on which it is mounted are flush.

Fugitive colors—Colors which are not permanent but fade when exposed to light.

Key plate—The plate in a set of color plates that carries most of the detail.

Magnesium plate—A halftone or etching made on magnesium—which is lightweight but strong, adaptable for high speed etching—usually 11 points thick.

Negative—A photographic image of original. It can be on paper, film, glass or metal.

Routing—Cutting away of non-printing metal or surfaces.

Tint block—A solid plate used in printing a light flat color.

Transparencies—Transparent positive photographs in black and white or color.

Work and tumble—Printing the second side of sheet, by turning over from gripper to back—using the same side guide.

Work and turn—Printing the second side of sheet by turning it over from left to right—using the same edge of the paper as the gripper.

Photo Offset

Another printing method in very general use incorporates many of the same steps as used in letterpress. Because it plays such a big part in the graphic arts field, it is important that a somewhat brief outline be given to it. One advantage is the versatility of the method since one can print by the offset method on any kind of paper—that is the surface may be rough or smooth and yet a halftone of any screen can be used—fine or coarse. This is primarily due to the fact that instead of printing directly on the paper from a rigid metal plate, it is transferred or printed on a rubber blanket fixed on a roller or cylinder and then offset onto the sheet of paper. Because this printing is done from a rubber blanket which will conform to irregularities in the surface of the paper, there is no problem of screen to contend with. The method is particularly suited to long runs—because of the high speeds of the presses used.

It is hoped that the very brief descriptions given in this series of editorials on photoengraving have given a little clearer picture of methods and steps involved. Understandably, the steps have been over-simplified in order that such a big area could be covered briefly.

W. W. CHREIMAN

MINNESOTA HEART ASSOCIATION

Among a dozen volunteer health agencies in our state, none shows greater promise of becoming a major force in the struggle for better health among our citizens than the Minnesota Heart Association. The physician under constantly increasing responsibilities of medical patient care finds little time for consideration of the place and importance of the voluntary health organizations in his own community, county or state and may lose sight of the valuable contribution that an enlightened and informed public may make toward the advance of medical care.

Last year, the people of Minnesota gave to the American Heart Association almost one-half million dollars to advance the support of cardiovascular research, and professional and lay education in problems of cardiac disease. Thus, in a

short space of eight years since the inception of the Minnesota Heart Association, it has gained the confidence of the citizens of Minnesota. The Minnesota Heart Association was founded by physicians, a group of internists interested in the advance of our knowledge of heart disease. In 1948, the Minnesota Heart Association became an affiliate of the American Heart Association and the goal of this organization was, and continues to be, that of supporting and stimulating research in cardiovascular disease and to promote professional as well as lay education in cardiovascular disease. The Heart Fund, the money raised through public contribution, provides the financial support.

In 1951, the Minnesota Association of Life Underwriters sensed the importance of this growing organization in the field of better health and agreed to accept the leadership for the annual solicitation of funds. The dynamic leadership provided by this organization is reflected by the fact that last year a total of 38,000 volunteer workers aided in the Heart Fund drive and a total of \$460,243 was contributed. What is being done with this money that has been provided by a generous public?

We are certainly not unaware of the responsibility placed on us to see that these funds are expended where they will create the greatest health return value to the public. The physician, more readily than the layman, is willing to accept the fact that progress in the fight against cardiovascular disease lies primarily through research, and the Board of Directors of the Minnesota Heart Association, consisting of men and women in both medical and nonmedical fields of interest, has continued to maintain the primary goal of support of cardiovascular research with the funds entrusted to it.

A committee of the Minnesota Heart Association on Research Allocation has recently assigned financial support to fifty-five cardiovascular research projects in Minnesota. Total American Heart Association and Minnesota Heart Association allocations reached \$314,000. The University of Minnesota has been the largest recipient of these funds, owing to the unusual facilities and interest in cardiovascular disease and excellent personnel of research capacity at the University of Minnesota Medical School. The Mayo Clinic has not requested grants from the Minnesota Heart Association for support of its research program but fellowships in cardiovascular research

have been assigned through the Mayo Foundation. Other institutions receiving grants for cardiovascular research are the Mount Sinai Hospital, Minneapolis, and Ancker and Miller Hospitals in St. Paul. Unfortunately, a large number of requests from qualified investigators for research support must be either reduced in amount or rejected because of lack of available funds. Adequate support for all qualified requests for research-support in cardiovascular disease would require an increase from 50 to 75 per cent in the funds now available.

In education, the Minnesota Heart Association continues to present factual information to the public and utilizes every tool at its disposal for public information and communication. Through the growing interest of both professional and lay personnel in the heart program, Heart Councils now are active in twenty-seven counties in Minnesota. Television and radio programs and an excellent film library, as well as information through pamphlet form, are being presented to the public in an effort to obtain closer understanding between the physician and his patient with problems of heart disease.

Another vital responsibility of the Minnesota Heart Association is in the field of professional education. Advances in cardiac research, diagnosis and treatment of cardiac disease are being presented to the physician under the stimulus and support of the Minnesota Heart Association in the form of lectures by outstanding authorities in the field at County and State Medical Society meetings and through major symposia on heart disease. These latter symposia have brought international recognition to Minnesota, owing to the excellence of the programs arranged.

Modern Concepts of Cardiovascular Disease, a monthly publication presenting an authoritative review of current cardiovascular problems, is sent free to any physician in the state requesting it. The *Heart Bulletin* is at present being sent to 1,500 physicians in the state as a service in professional education and the current "Concepts" page in MINNESOTA MEDICINE is directed by the professional education committee of the Minnesota Heart Association.

Requests for financial support of patient medical care for those suffering from cardiac disease come to the Heart Association frequently. These requests, of course, cannot be granted but the

office of the Minnesota Heart Association offers referral help for these patients through proper medical and welfare agencies.

Of all funds raised through the Minnesota Heart Association, 75 per cent remains in Minnesota to carry out the work of the Heart Association; the remaining 25 per cent is sent to the American Heart Association with which Minnesota chapter is affiliated. Owing to the excellent research facilities existing in Minnesota, the American Heart Association has consistently returned more funds to the state than is sent to it by the Minnesota Heart Association.

Analysis of state and national research allocations in Minnesota reveals the fact that 64 cents of each dollar contributed to the Heart Fund is expended on cardiovascular research. Naturally, the Minnesota affiliate is very proud of the program established in this state in support of cardiovascular research and is equally proud of its ability to raise sums of money from a generous public for its goals at a cost of less than 9 cents per dollar. Staff members are indeed confident that the physicians in Minnesota will continue to lend their moral as well as their financial support to the Minnesota Heart Association.

ROBERT L. PARKER, M.D.

LOANS AND SCHOLARSHIPS FOR MEDICAL STUDENTS

One of the major items of interest of the present Medical Student Committee is financial aid for medical students. Finances are a pressing problem to most medical students, and the Committee feels that this problem is not being met as adequately as it might be met. Accordingly, we are seeking to establish a more effective program than is presently offered at the University.

We feel that there is a need for three main types of financial assistance. The scholarship program at the University is improving all the time. The major contributor to this program has been the Minnesota Medical Foundation. These scholarships are awarded on the basis of need as well as scholarship. They are well publicized and much sought for. Complaints from other students that these scholarships have been inequitably distributed have dwindled markedly. Indeed, the Foundation is learning the art of giving money away. It is true, however, that it is extremely difficult for a Freshman to get a scholarship un-

less he has a four-year degree from one of the State Colleges. Nevertheless, the Medical Student Committee heartily endorses the scholarship program and hopes for its expansion.

The Committee feels that two other types of financial assistance should be offered, which at the present time are woefully inadequate. We believe that a grant-in-aid program should be established whereby the student in acute financial distress upon some rare occasion might receive a financial gift without the fanfare associated with a scholarship. Finally, we think that the present loan system is antiquated and insufficient. We feel that a student in medical school should be a good loan risk unless he is in dire scholastic distress.

To obtain a University loan at the present time is a very tedious, humiliating, and often unrewarding procedure. The maximum amount that a student can borrow from the University is \$500 in any one year or a \$750 total, regardless of how many years are spent at the University.

Just how many medical students really need a loan from the University is not actually known. It is safe to assume that the few medical students who really do need to borrow will need to borrow more than \$750 in four years.

To evaluate these needs more accurately, the student body is being surveyed. Student Committee members composed and distributed questionnaires recently to every student. Students were asked to evaluate their needs and their sources of support, among other things. The Dean's office sponsored the survey, but its results have not yet been computed.

The Medical Student Committee is certain of the need for financial assistance for medical students, and hopes to be able to make some more specific recommendations based upon the survey results.

RALPH B. SWANSON
Medical Student Committee

THE MINNESOTA EUGENICS SOCIETY

The Minnesota Eugenics Society existed between 1922 and 1930. It was at its peak from 1925 to 1927, and it was in 1927 that Dr. Dight corresponded with President Lotus D. Coffman of the University of Minnesota concerning the possible Institute of Eugenics which Dight envisaged at the University. Dr. Dight wrote his will that year and bequeathed his estate to the University for that purpose. It is rather startling

that none of his other multitudinous interests, such as better training for nurses and other public health projects, were provided with even token bequests!

The provisions for the eventual utilization of his estate by the University were clearly written and at the same time general enough in nature so that they would be adaptable to a changing environment. In return for the bequest, the University was to provide academic instruction in human genetics, carry on research in the field, provide a free counseling center for the public where the people could obtain answers to their questions about heredity, and finally to establish new eugenics societies. It was no doubt apparent to the University that Dr. Dight's estate was inadequate for the support of such an ambitious program. However, there was sufficient enthusiasm for Dr. Dight's unique concepts so that when the bequest eventually materialized, it was accepted by the University.

Dr. Dight did not decrease his personal activity in the field of eugenics, even though the eventual disposition of his estate had been provided for, and his Eugenics Society was defunct. Between 1921 and 1935, more than 300 of his letters on eugenics were published in the Minneapolis daily newspapers. In 1927-1928, he gave a series of eleven talks over station WRMH and, in 1933, a series of twelve lectures over the same station. In 1935, the *St. Paul Dispatch* reported on an address which Dr. Dight gave before a group of 250 people. He was then seventy-nine years old.

Everyone must die, or social problems would develop which would seem insoluble even to Dr. Dight. His demise came on June 20, 1938, when he was eighty-two years of age.

A review of Dr. Dight's accomplishments shows a man intellectually in advance of his times. He was a radical—one who wants to try something new and is sure that it will work while most others doubt it. His idea of prepaid medical care is now acceptable to almost everyone. Few who have heard of typhoid fever or brucellosis would oppose his crusade for compulsory pasteurization of milk used by the public. There are still many who would oppose his crusade for voluntary sterilization of the unfit, and for the fit whose genetics indicate a serious likelihood of the production of further abnormal children. The opponents of voluntary sterilization are more strongly entrenched than were the milk companies that op-

posed pasteurization, but no group can hold back permanently the benefits medicine can bestow.

It would not be fair to judge Dr. Dight merely by the amount of legislation which he inspired, significant though it was. The endowment which one leaves at his death is the only thing of significance. The endowment may be a collection of bird prints, good heredity in your offspring, teachings worthy of reproduction, or the few dollars and the small library left by John Harvard. Cash without ideas is not enough—but it is very useful in almost any situation. Dr. Dight left some very large ideas and a little of the wherewithall needed to activate them. The University has faith that money will come from somewhere to ensure the proper execution of its compact with Dr. Dight. Dr. Dight's basic concept that man is susceptible to genetic improvement will not die.

SHELDON C. REED

University of Minnesota

TELEPHONE OF THE FUTURE

What will the telephone of the future be like?

No one knows exactly, even the telephone engineers themselves. But they have some ideas that may prove to be practical. If they work out, tomorrow's telephone will probably do many things undreamed of by today's telephone users.

Its appearance will undoubtedly undergo radical changes. Some models will be made smaller and more streamlined to a point where they can be carried around in one's pocket. The base of the instrument perhaps can be eliminated, the dial made much smaller, and the transmitter would become a small microphone located in the center of the dial. The whole instrument may not be much larger than an electric razor.

It may not even have a dial at all—push buttons will be used instead. In fact, on the more recent long distance switchboards, operators are now using push buttons instead of dial wheels to dial numbers in distant cities.

Telephone scientists are thinking up ways to make it easier for the user to place calls. Maybe a pre-set arrangement can be developed so that many of the numbers called frequently could be set up in advance. Then all one would do would be to select the number wanted, punch one button, and the apparatus would dial the number. This might be a number in the community or in some city across the country, because

each person would be dialing his own long distance calls as well as local calls. If the line was busy, he would replace the receiver, and when he lifted it again a few minutes later, the equipment would dial the number again automatically.

Speaking of the lines being busy, telephone engineers are thinking about a signalling device that would let one know that another call is waiting. By some sort of switch, the call of the person already on the line would be held while the waiting call is being acknowledged and then the first call would be resumed.

Going a little further into the realm of the imaginative, the day may come when any mechanical means of dialing will not be used at all, but the voice will be used instead. That is, the person telephoning will simply speak a number, and electronic equipment will translate the sound waves of his voice into electrical impulses.

This has been done in the laboratory, but in practical application, the difficulties are enormous: how to get the equipment so it will recognize the number whether it be delivered in a soft southern drawl, or with a midwest twang; whether it comes as the voice of a nice little old lady or a brash teenager. This one is a long way off, say the telephone engineers.

Some day we may wear telephones on our wrists! For short range conversation, telephone research people are thinking of a small radio-telephone about the size of a wrist watch, powered by tiny long-lasting batteries and using transistors instead of vacuum tubes.

In the future, the person who starts his conversation with "Guess who this is" may become a thing of the past because some models of tomorrow's telephone may include a TV screen so that the person on the other end of the line may be seen.

Many of these ideas are already being tried experimentally. Others are just in the "maybe-some-day-we-can-do-this" stage. Whether they ever materialize or not will depend on many things: technical progress, whether there is real public need, how much they will cost and other factors. But changes are coming. To say they aren't would be comparable to a report made by a patent office commissioner in the year 1848. He said all worthwhile inventions had already been made!

NORTHWESTERN BELL TELEPHONE COMPANY

REHABILITATION IN PULMONARY TUBERCULOSIS

The Principles of Rehabilitation and Vocational Training

The search for an immediate assessment of the working-potential of the patient still continues; it has not been found in formulae, from graded exercise to sedimentation rates. Some physicians hope that the time factor alone will give the answer, just as it has given the only safe answer to prognosis on breakdown; others, without any preliminary test, place their patients in categories immediately following the stage of active treatment, boldly stating that they are fit full-time, fit part-time, or unemployable. This is why many younger clinicians who pin their faith on the efficacy of modern therapy say that there are now only two types of patients, convalescents and failures, the former requiring only a toning-up process of a few weeks before return to full work, the latter condemned to the placebo of home work or occupational therapy which will replace permanent hospitalization.

Such physicians forget two lessons of the past which are individual to each patient; first, that the only test of working potential is to place the patient under observation in the actual conditions of industry; second, that all after-histories show variations, often quite unexpected, in the two years following discharge from hospital or sanatorium, and equal variations during the danger period of an additional three years.

The return to full work should be slow, even for the machine worker, and especially if he is learning a new trade. The mental concentration required can, in itself, be disastrous; a close watch is necessary on its physiological and functional effects. If at all possible, it should begin in a sedentary fashion; added physical fatigue will increase these effects.

A knowledge of the background of education, training and social requirements is a prime essential. It is often the only index for psychological rehabilitation. The modern physician has learned that a true history can be got only by listening to the patient's full story. This is how he will sift any factors that predisposed to the first clinical illness from those due to the stresses of diagnosis and treatment. Many patients require kindly consideration of their fears of insecurity in working and earning capacity that very often lie behind

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J. ARNOLD BARGEN, M.D.
President, Minnesota State Medical Association

President's Letter

TO: MEMBERS OF THE MINNESOTA STATE MEDICAL ASSOCIATION

We are now in the second century of the activities of the Minnesota State Medical Association, an organization that has been working tirelessly for the greater good and the better health of the people of Minnesota and the nation. This association has been in the forefront of medical progress and organization for many years, and to serve as its president entails unusual opportunities and obligations. I am proud to have been selected as its spokesman for 1957.

While the office of president has carried with it the esteem of medical men of the state, it has also demanded of the physician so honored a selfless dedication to the highest ideals of a noble profession. My predecessors have given unselfishly of time and effort to uphold the fine tradition and to advance the aims of our association.

I have often been amazed at the sacrifices made by the men who carry on the activities of this organization. They serve without thought of remuneration. Some give up many Sundays to attend meetings of the Council, where discussions may last all day and may continue on into the wee hours of the morning. In winter, this may entail 200 or 300 miles of hazardous travel; in summer, it may mean the sacrifice of a nice summer Sunday for recreation, possibly the only day of the month available for that purpose.

The Council meets regularly four times a year and in special session at least two or three times a year. Each meeting requires a full day, or more, of the nine councilors, the four delegates to the American Medical Association, the president, the vice president, the secretary, the treasurer, the speaker of the House of Delegates, various committee members, the executive secretary and his associates, and those appearing before the Council with their grievances or reports.

In addition, meetings of committees occur at various times throughout the year, usually in the evening, and require physicians to drive to St. Paul from all parts of the state, with sacrifice of time and energy. Yet those appointed to committees serve devotedly the task of advancing the health of the people of Minnesota.

The committees for 1957 have been appointed. The members of these committees are privileged to help solve the problems that face nearly 4,000 physicians in their efforts to provide high-quality medical care for the people of our state. Attendance at committee meetings is very important and requires personal sacrifices, so that no one unwilling to make these sacrifices accepts a committee appointment. It certainly speaks well for the profession when, in spite of the sacrifices required, physicians all over the state cheerfully accept such committee appointments and seem eager and willing to serve.

The honor and privilege to serve as the leader of such a devoted group of men and women come to only one physician a year. Naturally, then, he desires and needs all the help and advice he can get from all the physicians of the state to the end that the health and well-being of the people may be enriched and that the respect of others toward the members of our profession may rightly be enhanced.

To these ideals, with your help, I shall devote myself.

A large, elegant handwritten signature in dark ink, reading "J. M. Bergen". The signature is fluid and cursive, with a large loop at the end.

President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

MEDICARE PLAN LAUNCHED IN DECEMBER

The military dependents' medical hospital care program went into operation December 7, 1956. Information was sent out to all members of the Minnesota State Medical Association and as further material is released, it will be passed on. The government still must settle on proper identification procedures and will be publishing a "Nomenclature of Procedures" booklet. Questions on the program may be referred to "Medicare," Minnesota State Medical Association, 496 Lowry Medical Arts Building, Saint Paul, 2. For Minnesota, Mutual of Omaha will be the fiscal agent handling hospital bills.

Anticipating many questions arising from the Medicare program, the Office for Dependents' Medical Care (ODMC) has issued several communications:

1. *Identification.*—Military dependents may submit as identification their post exchange card, the combined post exchange-commissary-military medical care card, or the standard military dependents' identification card. After July 1, the only identification honored will be a special Defense Department Medicare card.

2. *Payment for Drugs.*—ODMC says there are no plans for authorizing payment for drugs, medicinals or other medical supplies except those furnished while hospitalized or those administered directly by a physician.

3. *Claim Forms.*—The Government Printing Office is turning out large quantities of the claim form titled "Statement of Services Provided by Civilian Medical Sources" and they are being sent to the states as rapidly as possible. The State Medical Association will be glad to furnish extra claim forms to physicians on request. They are to be filled out in triplicate, one for the physician's file, and two to be sent to the state office for processing.

ODMC also stresses that it is intended that civilian medical care under the program be comparable to that provided in armed services facilities. Physicians participating will receive payment for their usual charges to their patients.

AMA LEGISLATIVE MACHINERY SUMMARIZED

A Senate subcommittee recently heard a detailed explanation of how the AMA conducts its legislative work. Senator Edward J. Thye (R., Minn.) was a member of the committee which conducted the hearing. Outlining the AMA operations were Dr. David B. Allman, AMA president-elect; Dr. Cyrus Maxwell, assistant director of the AMA Washington office; C. Joseph Stetler, head of the AMA law department and James W. Foristel, Washington office legal adviser.

The AMA spokesmen made these points:

1. The AMA takes no part in partisan fund-raising or other partisan activities.

2. The House of Delegates establishes Association policy, but if the time factor makes this impossible, the Board of Trustees is empowered to make decisions.

3. Information is sent to all state societies on national legislative problems and their support asked. There is nothing compulsory about it, however.

4. The Washington office does not keep a "box score" of lawmakers' general voting records, sending out this type of information only if asked.

5. Of the total AMA budget, not more than 2.5 per cent is spent on legislative efforts.

CIVIL SERVICE WORKING ON NEW FEDERAL HEALTH PLAN

The Civil Service commission is making a new effort at developing a federal employees' health insurance plan, one that will combine features of both basic and major medical expense coverage. Some officials believe that this time, after repeated failures, a plan can be worked out that will be acceptable to employees' unions, commercial companies and Blue Cross and Blue Shield. An administration proposal for catastrophic illness coverage failed to get through the last Congress because of objections from some unions and the non-profit plans. A previous attempt at a plan for basic coverage also failed to get off the ground.

In the event that a bill combining the best

features of both approaches is agreed on, Congress may enact a law by next July, according to the more optimistic officials.

The House Civil Service Committee expects to receive in several weeks, a report from the General Accounting Office on estimated costs of administering a payroll deduction plan for basic medical coverage. The report was requested last summer by Chairman Tom Murray after the administration's catastrophic coverage bill was not acted on. The GAO queried eleven prospective carriers, commercial and non-profit, on what they felt agencies would have to do under a payroll plan. GAO then drafted criteria for discussion among the various agencies.

The American Federation of Government Employees has proposed a "package" program which would include these features: (1) a federal employee would be permitted to buy both basic and major medical coverage through any one of a number of carriers providing the medical plan met certain government criteria, (2) the government would not set up or operate any health insurance plans of its own, and (3) employee and government would share equally in payment of premiums which would be handled through payroll deductions.

FEBRUARY SELECTIVE SERVICE CALL LARGEST IN TWO YEARS

Selective Service plans to call up 450 physicians in February, 250 of them for the Army and 200 for the Air Force. This is the largest single call since the Army, Navy and Air Force took 1,275 men in March, 1955.

The doctor draft extension bill is scheduled to expire July 1 and the Defense Department has indicated it would not ask for another extension.

RISE IN HOSPITAL ADMISSIONS INDICATED

Almost three times as many Americans are admitted to hospitals today as were twenty years ago. Six out of every 100 Americans were hospitalized in 1935, but in 1955, 13 out of every 100 were admitted, with further increases predicted for the future. The American Hospital Association reported that in 1955, U. S. hospitals spent \$5,594 billion to care for patients and newborn infants compared to \$5,229 billion in 1954. The non-profit general hospitals which care for the great majority of the acute-short term cases

in the nation, spent an average of \$25.15 a day for the care of each patient. This represented an increase of \$1.37 over 1954.

Hospital expenses continued to rise, reflecting the increase in payrolls and the increased cost of supplies and equipment. Sixty-four per cent of hospital expenditures was for payroll.

STATISTICS ON PHYSICIANS AND NURSES RELEASED

The world now has 1,200,000 physicians, and the 595 medical schools of eighty-five countries turn out between 50,000 and 60,000 new doctors each year according to a recent survey. The doctors, however, are unevenly distributed among the world's 2,500 million people. Fourteen countries have one doctor to serve up to every 1,000 people, but 222 countries have only one doctor for every 30,000 inhabitants or more.

A survey released by the American Nurses Association reports that 28,000 more professional nurses are at work today in this country than were two years ago. The increase is due to a variety of factors which include the higher rate at which married nurses are returning to the profession, and the increase in the number of part-time employees.

LEGAL MEDICAL MATTERS

Close Cooperation Between AMA and ABA

Indications of closer co-operation between medicine and the law will undoubtedly lead to the successful accomplishment of many objectives which are common to both physicians and attorneys. There have been a number of joint meetings between AMA and American Bar Association groups in recent months. At a fall meeting in Baltimore, Dr. Ernest Hammes, Saint Paul, participated in a panel on the subject of impartial medical testimony.

AMA-ABA Action on Jenkins-Keogh Bill

Vigorous action is being organized by the American Bar Association in support of a new bill—similar, but not necessarily identical to the 1955 Jenkins-Keogh Bill—for introduction in the 85th Congress this month.

This bill was introduced to help all self-employed people set aside part of their earnings for retirement. However, it died in the Ways and Means Committee.

The Physician as a Medical Witness

In a recent article entitled "You, Doctor, Will Be A Witness," C. Joseph Stetler, head of the AMA law department, suggests that the legal profession become more active in familiarizing the doctor with courtroom procedure and the "do's" and "don'ts" which should govern a medical witness.

He specifically suggests that the physician called as a witness "fear nothing about court procedures, that there is no real magic about testifying." He also says, "don't testify as an expert unless you are satisfied that you are qualified in the area of specialization involved." A third suggestion is "do not neglect to inform your patient's attorney of all unfavorable as well as favorable facts" and to "be courteous and to tell the truth without reservation or exaggeration." He adds that a physician should "not be smug; a modest attitude is much more impressive." Also, the physician should not regard it as an admission of ignorance to indicate that his opinion is not conclusive." Nor should the medical witness use terminology "which will not be easily understood; nor should he lose dignity in testimony, or lose his temper."

U. S. STEEL OFFERS NEW MAJOR MEDICAL COVERAGE

U. S. Steel's Group Insurance Plan for its salaried employes not entitled to compensation for overtime has been broadened to provide protection against costs of serious accident or prolonged illness that could be financially catastrophic. The new major medical expense coverage pays 80 per cent of a broad range of medical, surgical, laboratory, nursing, therapeutic and pharmaceutical costs that may be incurred by an eligible employe or his dependents beyond the basic surgical-hospital benefits previously provided in the Group Insurance plan. These benefits have also been liberalized.

SURVEY REPORTS OF INTEREST TO PHYSICIANS

The Doctor's Investment Woes

An investment house recently submitted an analysis of the doctor as an investor. It concluded that the "keen analytical mind of the examining room does not necessarily carry over into financial matters." An investment counselor who has handled doctors' financial affairs for many years

stated that "the typical doctor tends to plan wisely from the standpoint of a good life insurance program, and often a good annuity program, but then he's likely to scatter sums on speculative issues, many in the penny class, or to tie up sizable amounts in conservative mutual funds." He adds that a good investment program for a physician is "one that is custom-tailored to the individual's investor's needs, to meet a clearly-defined objective. "For instance," adds the investment counselor, "an older physician with a larger income might require blue-chip securities with a steady yield. A younger man, with a longer earning expectancy and lesser responsibilities, might be better off with growth stocks that have a deferred pay-off." He concludes by stressing the fact that "reliability in an investment firm is vital, and membership in the New York Stock Exchange is a good index to reliability."

Income Comparison Survey Results

A recent survey of representative communities all over the country reports on a "basic shift in our traditional income patterns." The most important general fact which stands out is that almost everybody except the farmer is making more money than ever before. The average total income of U. S. families exploded upward by a full third between 1947 and 1955 . . . from \$4,130 to \$5,520. Living costs also rose, but even allowing for this, the average family enjoyed a real dollar gain in that period of more than \$650 a year. The survey goes on to report that "doctors have come up as the most conspicuously prospering group in our country . . . the baby doctors in particular because of our booming birth rate. Among others who are doing outstandingly well are bricklayers, factory foremen and sales experts such as advertising men. On the other hand, the new relative poor include bank tellers, policemen . . . and income tax collectors!

FACTS ON MEDICAL EDUCATION

AMEF State Chairmen to Meet

The sixth annual meeting of state chairmen of the American Medical Education Foundation will be held in Chicago on January 27. At the opening session of the House of Delegates in Seattle, the AMA announced that it is making another gift of \$125,000 to the AMEF, bringing to \$343,000 the total amount which the AMA has contributed to the Foundation this year. The

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AMERICAN MEDICAL ASSOCIATION

Report on Actions of the House of Delegates

Medical ethics, veterans' medical care, radioactive isotopes, continuance of the AMA interim session, hospitalization for patients with alcoholism and a report of the Committee on Medical Practices were among the wide variety of subjects acted upon by the House of Delegates at the American Medical Association's Tenth Clinical Meeting held November 27-30, 1956, in Seattle.

Dr. Edward M. Gans of Harlowton, Montana, was announced at the opening session Tuesday as the 1956 General Practitioner of the Year. The annual award, carrying with it a gold medal and a citation, is presented to a family doctor selected by a special committee of the Board of Trustees for outstanding community service. Dr. Gans, who is eighty years old, has practiced medicine for fifty-one years and has been in the Harlowton area for the past forty-four years.

Strongly condemning government intervention in medicine, Dr. Dwight H. Murray of Napa, California, AMA President, told the opening session that "the medical profession, along with business and industry, is caught between those who desire to promote sound government programs and those who desire even more intensely to perpetuate party politics. Unfortunately, in recent years a benevolent federal government appears more attractive to the voting public than the preservation of individual freedoms. Medicine must do its utmost to reverse this trend."

Total registration at the end of the third day of the meeting, with half a day still to go, had reached 5,191, including 2,738 practicing physicians and 2,453 residents, interns, medical students, nurses and guests.

Medical Ethics

Subject of greatest interest at Seattle was the proposed ten-section revision of the Principles of Medical Ethics originally submitted at the June, 1956, Annual Meeting in Chicago, where final action was deferred until the Seattle session. The proposed short version of the Principles was re-submitted this week, with some changes based on suggestions received since last June by the Council on Constitution and By-Laws. The House of Delegates, however, decided to refer the matter back to the Council on Constitution and By-Laws for further study and consideration. The reference committee report adopted by the House included the following statements:

"Careful consideration was given to the Preamble and the ten sections of the proposed principles. The Preamble and seven of the ten sections appear to be acceptable in their present form.

"Sections 6 and 7 were not acceptable as presented

either to the group which appeared at the hearing or to your reference committee.

"Out of the general discussion the reference committee received the crystallized opinion that at least four areas needed more specific attention in Sections 6 and 7. These are: (1) division of fees; (2) the dispensing of drugs and appliances; (3) the corporate practice of medicine; (4) greater emphasis concerning the relationship between physicians and patients.

"In addition, the reference committee felt that the wording in Section 10 could be improved if amended to read as follows:

"The responsibilities of the physician extend not only to the individual but also to society and deserve his interest and participation in activities which have as their objective the improvement of the health and welfare of the individual and the community."

"In view of the above your reference committee believes that the proposed Principles of Medical Ethics should be referred back to the Council on Constitution and By-Laws for further study and consideration of the above stated principles.

"In the short space of time at our disposal and in view of the importance of the subject, your reference committee did not deem it wise to attempt to properly phrase these concepts.

"We would also recommend that if possible this study be completed at least six weeks prior to the June session and that the new version be published in *The Journal* in order that all interested physicians might have an opportunity to comment thereon."

Veterans' Medical Care

The House revised AMA policy on veterans' medical care by endorsing in principle the following paragraph suggested by the Council on Medical Service:

"With respect to the provision of medical care and hospitalization benefits for veterans in Veterans Administration and other federal hospitals that new legislation be enacted limiting such care to veterans with peacetime or wartime service whose disabilities or diseases are service-incurred or aggravated."

This action eliminates the temporary exceptions which were made in the June, 1953, policy regarding wartime veterans who are unable to defray the expenses of necessary hospitalization for non-service-connected cases of tuberculosis or psychiatric or neurological disorders. In making the policy change, the House approved this supplementary statement:

"We recognize the laws and administrative extensions of the law that are now in operation. We feel that under the circumstances it will be to the best interests of the public in general, and veterans in particular, if medical societies, county and state as well as national, develop committees to assist in guaranteeing VA hospital admission to service-connected cases. While the present law exists, we should help assure that veterans whose illness constitutes economic disaster will not be displaced by those suffering short-term remediable ills which, at the worst, constitute financial inconvenience."

In another action concerning veterans, the House passed two resolutions condemning as unlawful the practice of Veterans Administration hospitals which admit patients who are covered by workman's compensation insurance or by private health insurance and which render bills for the cost of their care. Both resolutions requested the AMA to take action to bring about a discontinuance of such practices by VA hospitals, and one of them instructed the Association Secretary to obtain from each state testimony or records of each known case that violates VA Reg. 6047-D1.

Radioactive Isotopes

The House rescinded the June, 1951, action, which limited the hospital use of radium and radioactive isotopes to board-certified radiologists, by approving a new policy statement which says:

"(1) In any hospital in which a patient is to receive radium or the products of radium or artificially produced isotopes, there should be a duly appointed Committee on Radium and Artificially Produced Radioisotopes of the hospital professional staff. This committee should include, but not necessarily be limited to, the following qualified physicians: a radiologist, a surgeon, an internist, a gynecologist, a urologist and a pathologist. This committee should have available such competent consultation of other physicians and scientific personnel as may be required by it. Where this is not practicable, the hospital staff should consult the nearest Committee on Radium and Artificially Produced Radioisotopes.

"(2) In any hospital, the use of radium or its products and artificially produced radioactive isotopes for diagnostic or therapeutic purposes shall be restricted to qualified physicians so judged by the Committee on Radium and Artificially Produced Radioisotopes of the professional staff to be adequately trained and competent in their particular use.

"(3) It is recommended that procurement, storage, dosimetry control and inventory of all radioactive isotopes for the use of the hospital staff and radiological safety control be centralized, and, where administratively possible, centralization be located in the Department of Radiology.

"(4) It is recommended that the Board of Trustees assign to the appropriate council or committee the continuous study of the problems of radiological safety control in the use of radium and its products and artificially produced radioactive isotopes for diagnostic or therapeutic purposes."

Clinical Meetings

Rejecting a resolution which recommended discontinuance of the interim sessions, or clinical meetings, the House adopted a reference committee report which said:

"We believe that the interim sessions should be continued because of the public relations value of these meetings to the Association and the educational value to physicians and the general public in the various geographical areas involved.

"It is the suggestion of the reference committee that maximum attention be given to these potential benefits in selecting a city for the interim meeting.

"It is our further recommendation that the Board of Trustees consider the advisability of holding an

Interim Meeting of the House of Delegates in Chicago each November or December and an Interim Scientific Session in November or December of each year in different parts of the United States. The reference committee suggests that the views of the Board of Trustees in this regard be reported to the House of Delegates next June."

Hospitalization for Alcoholics

To implement educational approaches to the problem of alcoholism, the House approved a statement submitted through the Board of Trustees by the Council on Mental Health and its Committee on Alcoholism. The House also recommended that the statement be brought to the attention of the Council on Medical Education and Hospitals, the Joint Commission on Accreditation of Hospitals and the American Hospital Association. It includes the following:

"The Council on Mental Health urges hospital administrators and the staffs of hospitals to look upon alcoholism as a medical problem and to admit patients who are alcoholics to their hospitals for treatment, such admission to be made after due examination, investigation and consideration of the individual patient. Chronic alcoholism should not be considered as an illness which bars admission to a hospital, but rather as qualification for admission when the patient requests such admission and is co-operative, and the attending physician's opinion and that of hospital personnel should be considered. The chronic alcoholic in an acute phase can be, and often is, a medical emergency."

Committee on Medical Practices

In approving a progress report of the Committee on Medical Practices, the House amended one of its directives to read as follows in order to remove any legal objections:

"The AMA representatives on the Joint Commission on Accreditation of Hospitals be instructed to stimulate action by that body leading to the warning, provisional accreditation, or removal of accreditation of community or general hospitals which exclude or arbitrarily restrict hospital privileges for generalists as a class regardless of their individual professional competence where such policies adversely affect the quality of patient care rendered. Any action taken should be only after appeal to the Commission by the county medical society concerned."

The House also approved a recommendation by the Committee on Medical Practices that a study group be formed to consider the best background preparations for general practice and it urged that such action be implemented as soon as practicable.

Miscellaneous Actions

Among many other actions on a wide variety of subjects, the House of Delegates also:

Urged the widest possible publication and distribution of Dr. Murray's *presidential address* at the opening session.

Pledged the full support of the Association's initiative and energy to President Eisenhower's

people-to-people program as a means of promoting understanding, peace and progress.

Directed the Board of Trustees to continue its investigation of the practicability of developing a *statement of AMA policies* and to arrange for the periodic publication of revised versions of such a policy statement.

Commended the objectives of the American Association of *Medical Assistants* and its sincere desire to work closely with the medical profession in improving medical service and medical public relations.

Noted with pride the good work being done by the 74,348 members of the *Woman's Auxiliary*, as reported to the House by Mrs. Robert Flanders, President.

Directed the Councils on Pharmacy and Chemistry and on Foods and Nutrition to conduct a joint study of all presently available information concerning the *fluoridation of public water supplies* and to present a documented report of findings and recommendations at the December, 1957, meeting.

Urged all physicians to participate actively in the formulation of medical policy for *prepaid medical care plans* which are under physician direction or sponsorship.

Changed the By-laws to extend *service membership* to reserve officers on extended active duty with the defense forces and the U. S. Public Health Service.

Changed the By-laws relating to *transfer of membership* so that an active or associate member of the Association who moves his practice to another jurisdiction may continue his AMA membership by applying for membership in the constituent association in his new jurisdiction, subject to a two-year limit on approval of his application.

Changed the By-laws so that the *election of officers* may take place at any time on the fourth

day of the annual session, instead of being restricted to the afternoon of that day.

Passed a resolution calling for the American Medical Association to join with the American Hospital Association and the American Institute of Architects in their proposed *study of hospital design and construction*.

Approved the principle of a voluntary reduction in the self-assigned *quota of interns* as printed in the 1956 handbook of the National Intern Matching Program.

Instructed the Board of Trustees to accentuate co-operation between the American Medical Association and the American Bar Association to the end that a bill of the *Jenkins-Keogh* type be enacted at the next session of Congress.

Citation and Contributions

At the Tuesday opening session, Dr. Dwight H. Murray, on behalf of the American Medical Association, presented a special citation to Ciba Pharmaceutical Products, Inc., for "the service it has performed to the medical profession and to the nation through its weekly television series, 'Medical Horizons'." At the same session, the American Medical Association and four of its constituent societies—California, Arizona, Utah and New Jersey—contributed nearly \$300,000 to the American Medical Education Foundation for aid to the nation's medical schools. The AMA announced another gift of \$125,000, bringing this year's total contribution to \$343,000. The amounts presented by the four states were: California, \$132,981; New Jersey, \$25,000; Utah, \$11,870, and Arizona, \$3,695.

J. ARNOLD BARGEN, M.D., Rochester

O. J. CAMPBELL, M.D., Minneapolis

GEORGE EARL, M.D., Saint Paul

F. D. ELIAS, M.D., Duluth

Delegates to the American Medical Association

FACTS ON MEDICAL EDUCATION

(Continued from Page 56)

practicing physicians of the nation have contributed nearly \$6 million to the Foundation since it was founded in 1951.

More Women Studying Medicine

The AMA reports that during the academic year 1955-56, 1,573 women were studying medicine in the seventy-six approved four-year medical schools in the United States. This was a 2.3 per cent gain over the previous year. The Woman's Medical College of Pennsylvania had the

highest enrollment of any school . . . 182. The medical schools of Columbia University and the State University of New York each enrolled 40 women or more.

States Producing Most Medical Students

Forty per cent of all first-year students in the nation's seventy-six approved four-year medical schools comes from six states: New York, Pennsylvania, California, Ohio, Illinois and Texas. Also, nearly 38 per cent of the nation's medical schools are located in these same six states.

Medical-Legal Opinions

By JULE M. HANNAFORD, Legal Counsel
Minnesota State Medical Association

With this issue, MINNESOTA MEDICINE initiates a new series of legal opinions of interest to the physicians of this state. These opinions were prepared by Jule M. Hannaford, legal counsel for the Minnesota State Medical Association. Mr. Hannaford is affiliated with the firm of Dorsey, Owen, Barker, Scott and Barber, Minneapolis.

NEW TAX REGULATIONS

Many tax-exempt organizations have purchased annuity contracts for their employees without going through the formality of setting up a pension plan qualified under the Internal Revenue Code. Tax-exempt (charitable) hospitals have been among the organizations which have done so. In many cases, they have done so for the benefit of physicians on their staffs, either on a full-time or a part-time basis. For some time it has been thought that the persons for whom the annuity contracts were purchased did not have to include in their gross income for income tax purposes the premiums paid on these annuity contracts by the tax-exempt organizations. On September 24, 1956, the Treasury Department issued new regulations which may affect every physician for whom an annuity contract has been purchased by a tax-exempt organization. The regulations provide that the physician need not include in his gross income for income tax purposes the premiums paid on such annuity contracts, provided the purchase of the annuity contract is merely a supplement to past or current compensation. The regulations then go on to describe what is meant by the phrase "a supplement to past or current compensation" in the following words:

"* * * One of the pertinent facts to be taken into consideration is the ratio of the consideration paid by the employer for an employee's contract to the amount of his past or current compensation. For example, if the annual premium paid for an employee's contract is \$1,000 and his annual salary is \$10,000, the ratio indicates that the premium paid for the contract is merely a supplement to the employee's current compensation. If, however, an employee receives no current compensation, or the annual premiums paid for his annuity contract approximate his annual salary, the amount paid for his contract will be considered to be current compensation and taxable to the employee in the year in which it is paid by the employer. Other pertinent considerations are whether the annuity contract is purchased as a result of an agreement for a reduction of the employee's annual salary, or whether it is purchased at his request in lieu of an increase in current compensation to which he otherwise might be entitled. In such cases, the amount paid for the contract shall also be considered to be current compensation."

Any physician for whom an annuity contract has been purchased by a tax-exempt organization

should, therefore, consult with his attorney on this problem before filing his Federal income tax return for the year 1956.

STERILIZATION

The sterilization of persons who are not inmates of institutions raises legal problems for the physician.

Therapeutic.—The first problem to be considered is that in connection with therapeutic sterilization, i.e., sterilization for the protection of the patient's health. There is little doubt under the decision of the Minnesota Supreme Court in the case of *Christensen v. Thornby*, 192 Minn. 123 (1934) that a sterilization performed in Minnesota upon a person is lawful where there is medical necessity for the operation. The court stated specifically in that case that sterilization, when a medical necessity, is not against the public policy of the state and is not therefore illegal.

There are no Minnesota decisions with respect to what consents are legally necessary before a therapeutic sterilization may be performed. However, the general rule of law is that a woman of mature years and sound mind is capable of authorizing an operation upon herself even though she is married and that the consent of her husband thereto is not needed. There should be no reason to distinguish on this score between a therapeutic sterilization and any other type of operation. However, because of a husband's particular interest in any sterilization and because the mental capacity of a woman contemplating sterilization might be questioned, we would strongly recommend that no therapeutic sterilization be performed by a physician on a woman unless her husband consents thereto.

There is no legal requirement that one or more medical consultants be called in before a physician performs a therapeutic sterilization. Nevertheless, because a physician's judgment as to medical necessity may be questioned in subsequent litigation, we would strongly recommend that where practicable at least one other physician be called into consultation before a therapeutic sterilization is performed.

Nontherapeutic.—The second aspect of this problem relates to what might be called nontherapeutic sterilizations. Such sterilizations might logically be divided into two types, i.e., those justified on social or economic grounds and those justified on no grounds except a desire of the patient to avoid pregnancy. Despite such possible sub-division of the problem, the courts up to the present time have recognized no such distinction and so both types will be considered together.

The problem in connection with such a sterilization is whether or not it is illegal even if done with the consent of both the husband and wife. At least three states have by statute declared nontherapeutic sterilizations illegal and one appellate court has reached the same conclusion without the aid of a statute. The theory behind both the statutes and the court decision is that the state has a sufficient interest in the perpetuation of its people to prevent sterilization when not required by medical necessity.

* Minnesota has no statute and no reported court decision on this question. The Minnesota Supreme Court, in the case of *Christensen v. Thornby*, *supra*, specifically refused to answer the question. Minnesota does, however, have statutes which prohibit abortion unless medically necessary, Minn. Stats. Sections 617.18 to 617.22, and which prohibit the selling or giving away of contraceptives, Minn. Stats. Section 617.25 (the contraceptive statute, incidentally, has no exception for medical necessity). These statutes could easily lead a court to conclude that the public policy of this state makes illegal any sterilization not required by medical necessity. We are in no position to predict how the Minnesota courts will decide this question which raises many religious, social and economic emotions.

If the Minnesota courts should decide that nontherapeutic sterilizations are against public policy and therefore illegal, a physician who performed such an operation would be faced with questions of both criminal and civil liability.

With respect to the criminal liability aspect, he might be prosecuted under the criminal law prohibiting a mayhem or the criminal law prohibiting an assault and battery. We are, however, of the opinion that the chances of success of such a prosecution, where both the husband and wife have consented to a nontherapeutic sterilization, is small because, to constitute either crime in Minnesota, the act must have been done with an intent to do harm. *State v. Hair*, 37 Minn. 351.

With respect to the civil liability aspect, a physician who performed a nontherapeutic sterilization with the consent of both the husband and wife might, notwithstanding such consent, be sued for damages on the theory that a consent to perform an illegal operation is void and therefore no bar to a suit. In the case of *True v. Older*, 227 Minn. 155, the Minnesota Supreme Court

specifically refused to decide whether consent to a nontherapeutic abortion barred recovery by the person who consented thereto. We therefore cannot predict how the Minnesota courts will decide this question.

If, despite the admittedly unsatisfactory status of the physician's potential liability, a physician decides to perform a nontherapeutic sterilization, we strongly recommend that he secure a written consent from both the husband and wife. We further recommend that the signing of such a consent should follow a complete explanation of the results of the operation to both husband and wife and a cooling-off period in which both can consider the problem further. We further recommend that both husband and wife should be told that at least some types of sterilization operations are not always completely successful. We make this recommendation particularly because in the case of *Christensen v. Thornby*, *supra*, the physician was sued because a pregnancy resulted after a sterilization of the husband. While such explanations and written consents may not in the final analysis save the physician from legal liability, they will place him in a much better position legally to defend any action that may be brought against him.

If a nontherapeutic sterilization is performed, there is no legal requirement that consultants first be called in. Moreover, we can see no useful purpose that their testimony could serve if a physician were later sued for performing such a sterilization.

REHABILITATION IN PULMONARY TUBERCULOSIS

(Continued from Page 51)

the superficial resentment of authority in nurses and doctors. These fears explain also why the patient-worker is often difficult in the early days of vocational training, why he is often restless in his anxiety to go too fast, or difficult to rouse out of his apathy to his new conditions. He has not learned that the first step in overcoming his disability is to accept it, and so will often ask for a change from the workshop which he blames for his disappointments.

The physician need not be a neuro-psychiatrist, but if he relies entirely on a fixed routine of anti-bacterial treatment, however good it may be, or believes perfection lines in the employment of the latest mechanical aids, he may preserve the lives of his patients but will not renew them.

R. R. TRAIL, M.D.
London, England

History of Medicine in Minnesota

THE HISTORY OF MEDICINE IN POLK COUNTY

J. F. NORMAN, M.D.
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In compiling a history of the early doctors in the Red River Valley, thought should be given to the Valley itself; its origin, and its changes through time.

The Red River Valley had been in the process of formation for untold ages. The present prairie part of the valley of Polk County was covered by a salt sea in the Cretaceous Age. Very little change took place either in the soil or on the surface during these millions of years of time. This inland sea extended from the Gulf of Mexico on up into the Arctic Ocean. In some places the sediment laid down shows up either in cliffs or rocky bluffs, such as the Missouri Couteau in the Dakotas, and in wells drilled on the east side of the Red River of the North. In the course of time the crust of the earth beneath this area began to rise, and eventually this sea disappeared. Then came a change with the climate becoming cooler. The earlier period was comparatively warm. Now, heavy snowfall was not thawed during the ensuing seasons and a glacier formed some hundreds of feet thick. This glacier moved south from the west of Hudson Bay and moved down what is now the Valley of the Minnesota River, cutting out the soil and denuding the north land of much moveable clay and other detritus. After some thousands of years, another change of climate brought about a disappearance by thawing of this great ice field. Meanwhile, the glacier had brought down a tremendous amount of till, clay, gravel, et cetera. The highlands of the north were ground to powder and deposited on the floor of the valley.

The next change was the thawing of the great glacier which, of course, started in the south, and caused the glacier to retreat northward, leaving a tremendous lake of fresh water, the great Lake Agassiz. After some thousands of years it finally broke down its northern ice barrier and drainage followed much in the present manner. Earlier, the water of the lake had flowed down through what is now the Minnesota Valley. The lake-bottom was gradually built up with silt which had been in suspension in the water of the lake, leaving a very fine soil when the water had disappeared. This took place comparatively recently geologically, possibly less than fifteen thousand years ago. It made this area one of the most fertile in the world, and one of the greatest agricultural valleys on earth.

No one lived here for a long while, but in time the Indians came. They were purely a hunting and fishing people who made no change in the valley. It was never very well settled by the Indians and they remained food gatherers instead of food producers; they managed to exist from day to day.

The first Europeans to visit what is now Polk County came from the East. They were traders, explorers and missionaries, probably French. They came to buy furs and to visit the savages, and later, to lay claim to the country for France. Radisson and DesGroselier came to Minnesota in 1658-1660 and in 1661 St. Luson made similar claim to the country for France. On the other hand, the Hudson Bay Company claimed all the land draining into the Hudson Bay, which included Polk County.

Most of the men who entered the territory, and there were few, were traders and

trappers. At the time of the Louisiana Purchase very little was known as to what should be the Northern boundary of this area, and finally, after the convention of Ghent in 1818, the boundary between the United States and Canada was placed at the forty-ninth parallel. This made the present area of Polk County indisputably American soil. In the treaty of 1863, the Chippewas ceded much of their valley land to the government. This treaty was signed at Huot, near Crookston. While the treaty was being signed, the Sioux Indians were laying siege to Fort Abercrombie at the southern end of the valley, where they attempted to capture goods and cattle en-route to the treaty signing. This treaty was called the Old Crossing Treaty, because at this spot the Red River carts would ford the Red Lake River. A steamboat was launched on the Red River of the North about 1859. It came up to Fisher, but was not of much importance for Polk County. The fur companies bought and transported furs through Polk County mostly by Red River carts. Several expeditions were made overland to Pembina on the east side of the river, and this took them into Polk County. At that time some people, including General Sibley, thought that the Red River Valley would never be fit for cultivation or for agriculture; they claimed it was too swampy, too flat and too cold, but one of the early acts of the new state legislature was to establish Polk County on July 20, 1858.

The medical history of Polk County is that of the medical history and progress of the State. Physicians arrived here late but they were better educated than earlier arrivals in the State.

The history of medicine started late in Polk County as compared to the rest of the State. During the 1850's and 60's settlers had poured into Southern Minnesota after the opening of Indian land following the Treaty of Traverse De Sioux. During the years 1860-69 there were neither Indians nor whites living in what is now Polk County, although they had been here earlier, but they left no impression on the county. There was no medical care by regular practitioners, only a certain amount of care by irregular quacks and Indian medicine men. This area had its flood of settlers during the decade 1870-1880. Some doctors came in and took homesteads, while others settled in towns. Many of these early doctors, some of them suffering from tuberculosis, came to Minnesota because the climate was spoken of as being very healthy. They took up homesteads, later going into practice. Practically all of them were young, though some were married and had families. Some stayed only a very short time and moved on. Even after the county was being settled, the quality of medical care was very poor, and many of the settlers resorted to self-medication, plus patent medicine, and charms, amulets or talismans. To the Indian, all medicines were charms, and were good or poor depending on whether the spirit in the medicine was strong or weak. The settlers had some of this feeling, an example being a charm possessed by someone, which would stop bleeding, even at a distance, the charm being the reciting of some words or incantation.

The late W. A. Marin, who practiced law in Crookston, has left some good notes on his frontier life on a claim near Crookston.*

Maternal care is well described by him, because his mother was an intelligent woman who acted as a midwife for her neighbors. He tells of a wagon driving up at night and his mother going out, to return some days later; some neighborhood wife had been helped at the birth of her child. An example of such help by a practical nurse was that of Grandma Tierney, who was an early pioneer. Her active life dated from 1870 to 1885. She would not accept payment for her help, and would insist on a doctor being present if she thought the labor was making slow progress. After delivery, she cleaned up the baby and laid out the baby's freshly

*This account is not published, but is preserved in the Crookston Public Library.

prepared clothes, then she asked for a piece of white "linen," had it put in the oven until it was browned, and she covered the navel with it. Therefore there were few infections of the cord stump. Many of these practical helpers were clean, using soap and water, and there was a low infant mortality until the baby's first summer on artificial feeding, when the mortality became high. At that same time the early doctor had a high maternal mortality and prolonged morbidity, for which often he was not to blame. Some physicians were too quick to use forceps, with scant use of cleansing agents. Self-medication was common among the settlers, such as, "Cherry-Pectoral" for colds, pneumonia or "consumption." Hoods Sarsaparilla was much used. Hostetter's Bitters had quite a vogue, although much of this was made up of very poor whiskey. These drug firms put out very interesting almanacs which were welcome, and which the small boys would read from cover to cover. They learned that some of these medicines were "good for man or beast," and for a boy at a time when books were scarce, much advice on non-medical subjects was absorbed.

At this time, should a settler get a laceration from a scythe or puncture from a nail, he might call some man in the neighborhood who would lay on some talisman, magic amulet, some "holy object," salve, or even raw pork. Later there would be laudable pus and there would be applied a hot poultice of bread, milk, flaxseed or others, such as a leaf poultice, (cabbage or another leaf). Some terrible infections occurred, but at the time there was no good medical help available. At this period it was common to know of "consumption" families. Perhaps the mother was tuberculous; soon a child would come down with it, and many died. They all lived in a small house, probably, perhaps several in one room.

About the time the Red River Valley was being settled the quality of medical care improved, and the type of physician changed for the better. In 1853 a group of physicians organized the State Medical Society in St. Paul. This group set about cleaning up their own profession. One problem was to set up standards of what was or was not good medicine. They set about revising their by-laws, and they were very much concerned about the high number of irregulars with irresponsible practice. It was hard to determine whether or not a diploma was forged or stolen, as the Eastern states were full of "diploma mills."

Some of the physicians who applied for licenses to practice in Minnesota had questionable backgrounds. Most of them had diplomas which did not promise much. Perhaps they had two years of study (though later they had three years of preparation), being limited to lectures, many of them repeated from year to year.

The number of regulars exceeded the irregulars only by a small margin. Membership in the State Society was denied to anyone who could not show satisfactory evidence of his being a legal practitioner of medicine. In 1870 the Society adopted an amendment to its constitution which set up a mechanism for examining prospective applicants for membership in the Society.

This period was one of a renaissance in the medical world, and its new life was felt wherever medicine was practiced—including Polk County.

Following the Chippewa cession of their valley lands, settlers arrived in greater numbers. With the exception of missionaries of various faiths, these new settlers came to make a profit buying and selling real estate and trading in furs. Many of them came to make homes for themselves and their children, and to build up a certain amount of financial security. Settlement was not opened in Polk County until 1870-71; then the opportunity to take up land by homestead was offered. The treaty of 1863 was not ratified until April 21, 1864.

The early boundaries of Polk County were indefinite, extending from the Red River of the North to Itasca and northward to the Canadian boundary. The

county was formally organized October 21, 1872, when the newly elected County Commissioners held their first meeting. For some time, the history of the new county was the history of Crookston, early called "Red Lake River Crossing." The city was designated as county seat and this was confirmed in 1873. Meanwhile, several counties were carved out of this territory and the limits of Polk County became defined much as they are now. The new county seat grew rapidly and became better organized and an ambitious citizenship developed.

The new county soon organized a board of commissioners. Present at that first meeting and acting as clerk, was E. M. Walsh, who later in life was a friend of this writer. Later he acted as treasurer of the new county.

These new citizens were mostly from the East and were of American stock, Irish and Scotch from the Dominion of Canada, French Canadians from Quebec, and many Europeans, mostly from Great Britain, were also included.

Increasing numbers of physicians came with these settlers and they were better educated than their predecessors. Medical care continued to improve and soon the physicians in the valley became associated with the other physicians of the State through their medical society.

As mentioned, the early history of Polk County was the history, in fact, of Crookston. The population in 1875 was 150 for Crookston and 197 persons for the entire district. Very early, schools, literary societies, and a philharmonic society were established. The literary society used its surplus funds to support a circulating library which speaks well for the young county and city. They began to feel conscious of their prairie type of town, so one citizen had his house painted to indicate the end of pioneer conditions. Pigs, though, were still allowed to run around a bit, and this was hard on the citizens who planted flowers and gardens. Drinking water was taken from the Red River.

The first preaching service conducted in Crookston was held October 2, 1877, with the Rev. M. G. S. Felton of the Glydon Union Church officiating. In 1878 the population of 300 boasted one drug store, three lawyers, two physicians, and a Union Church. This church was the first organized church in Crookston.

The first report of physicians in Polk County is that of Doctors Waterman and Welch, who reported a case of smallpox in Crookston, May 2, 1879. A pest house was built and one Theodore Binder was admitted, and it was stated that he was very well taken care of. In the fall of 1879 Crookston had four doctors and one dentist.

While Crookston and the surrounding valley took an early lead in the settlement of the North—and much early progress was made—it remained for transportation to the East to be improved. A railroad reached Fosston in 1888 or 1889, giving both farmers and merchants a better chance to get goods to and from markets. Later, because of dissatisfaction with their dealings with Twin City markets, especially grain terminals and mills, there was agitation for transportation to the head of lakes and to water terminals. This resulted in extending the railroad to Duluth in 1898 with new lands being opened up and much lumber being hauled.

The eastern half of Polk County was covered with growth of hardwood for wood and lumber, rolling rich lands and many lakes: an altogether beautiful place to settle. There were fish in the lakes, deer in the woods, and—in spring and fall—geese and ducks in the lakes. Soon much of the lands were taken, mostly by Scandinavians, many of whom came directly from Europe. They were of a high type, had high ideals, were ambitious to better themselves, and rapidly built up the country.

Physicians soon followed. Many were foreigners and because they were of a later school, they brought good service to the settlers. With the coming of the Northern Pacific Railway to Crookston, transportation at Fertile was much improved and that rich area opened to farming and to better medicine. The old days of long trips of twenty or more miles to market or for transportation for crops were passing.

This area was fast becoming a region of fine farms, homes and a stable population. Farming was not big business, but was progressive, and the area became a successful productive area. Fosston and McIntosh, too, became thriving cities with capable physicians.

During the last quarter of the nineteenth century the doctors of Minnesota were in the midst of universal renaissance. The practice of medicine was regulated by the Medical Practice Act of 1883. The State Board of Health, which had its inception in 1872, was growing in stature and its supervision and help could be felt even in the outlying counties of the state, including Polk County. Emphasis was placed on preventive medicine, especially the prevention of contagious diseases and general sanitation.

Vaccination was mandatory for such diseases as responded to such immunization efforts. The men in our State Department of Health had a special problem in the great lumber camps across the northern part of the state. This affected the health of Polk County as well as the other areas in that patients would run away from lumber camps and other labor camps. They would come to Crookston, Fosston, or McIntosh, and the municipality would have the problem of giving them care, shelter and food during quarantine.

One problem with which the State Department of Health contended was the indifference, often antagonism, of the owner or the manager of such lumber camps.† The men themselves were of such a type that they did nothing to use preventive measures and would avoid vaccination or such other precautions if possible. Smallpox was the common problem. An example of this was an experience at Crookston in 1885 when a smallpox case from T. B. Walker's lumber camp, about 70 miles east of Crookston on the Clearwater River, drifted into the city. He went into the Merchant's Hotel where a physician pronounced his case smallpox. The landlord of this hotel doubted the diagnosis. He later came down with variloid. Dr. Brown of the State Board of Health was sent north and found two cases in Fosston. One man of one of the camps became delirious with the disease and is supposed to have perished in the woods.

Dr. Charles N. Hewitt, the energetic secretary of the State Board of Health, was a relatively patient man, but after putting up the dilatory practices and evasions of a village where numerous cases of "Cuban itch" were at large waiting on tables, selling goods in the stores, et cetera, he quarantined the whole village. No one, including the farmers, was allowed to enter or leave the place. The trains did not stop, but pushed off the mail and would not take on any mail. All non-immunized persons were rounded up and vaccinated and the epidemic was soon under control.

Although some of the men in this territory had the old-type training with a course of lectures and not too much clinical training, the presence of a medical school in the state after 1888 made for better medical men and better treatment. Soon University of Minnesota trained physicians who spread over the state in greater numbers to the great advantage of the people and progress was rapid.

†*"The People's Health, a History of Public Health in Minnesota up to 1948,"* by Philip D. Jordan, Minnesota Historical Society, 1953.

A few remained in practice who insisted in preparing their medicines from the crude drugs, the quality and strength of which was not standardized.

Much of a doctor's practice was in the country over poor roads, through storm and drifted snow. Many calls were at night. Roads were unmarked, and there was danger of getting off the road. For the night call, the doctor would pick up his instruments and all other material he might need and call up the livery. His driver would eventually get to the doctor's home and they would bundle into the cutter, the doctor dressed in high overshoes, perhaps with a pair of mackinaw trousers over his regular clothes, an overcoat, and over that, a fur-lined coat and a heavy fur cap. He carried the little black leather bag containing the materials above mentioned. The cutter had a buffalo robe and its seat was covered with blankets, with another blanket beneath the robe. A foot-warmer was set on the floor of the cutter. Snow would blow and obscure the road and at some spots the doctor would hold the reins while the driver went ahead on foot to spy out the crossing. All this preparation was necessary because these sick calls were made at a distance of ten to twenty miles, often in bitter winter weather.

To be feared was the newly-drifted snow through which the horses would not be able to travel. Then, the doctor and driver would unhitch the team, get them out of the drift, pull the cutter out by hand, hitch up the team and on to the patient—all this in the dark and very cold weather with drifting snow and poor visibility. He might have to stay all night at the home of the patient and drive back to town in the morning, very tired but with little opportunity to rest during the day. Next fall he might receive as part payment, a quarter of beef or a turkey or a pig. These men went on without complaining. Part of the doctor's remuneration was a cordial "Hello, Doc!" when he met his patient on the street.

Now began an era when living out on the prairies presented less risk of disease and death. Typhoid, which had been endemic, gradually was reduced in incidence with the help of an alert State Board of Health. Vaccination was increased, cutting down the number of cases of smallpox per year. Diphtheria was being attacked by the physicians, with marked decrease in cases due to earlier and better laboratory diagnosis. The physician had much education of the public on his hands as it was difficult to get the cases early; the antitoxin and dosage had to be adjusted as more was learned about it. People also learned that tuberculosis was infectious and soon these cases were isolated.

(To be continued in the April issue)

Meetings and Announcements

STATE

MINNESOTA STATE MEDICAL ASSOCIATION, 104th annual meeting, Saint Paul, May 13, 14 and 15, 1957.

Mediclinics of Minnesota, Fort Lauderdale, Florida, March 4-14, 1957. For information write 516 Medical Arts Building, Minneapolis 2, Minnesota.

NATIONAL

American College of Radiology, annual meeting, Chicago, Illinois, February 8.

Alumni Postgraduate Convention, College of Medical Evangelists School of Medicine, Los Angeles, California, March 10-14. Managing Director, Alumni Postgraduate Convention, 316 North Bailey Street, Los Angeles 33, California.

American College of Surgeons, sectional meeting, Hotels Lowry and St. Paul, St. Paul, Minnesota, April 8-10, 1957. Write Dr. H. Prather Saunders, Associate Director, American College of Surgeons, 40 East Erie St., Chicago 11, Illinois.

American Congress of Physical Medicine and Rehabilitation, thirty-fifth annual scientific and clinical session, Los Angeles, September 8-13, 1957.

Centennial Exposition, Academy of Medicine of Cincinnati, Health Museum, Cincinnati, Ohio, February 27-March 5, 1957.

Centennial Exposition, 100th anniversary of the Academy of Medicine of Cincinnati, Music Hall, Cincinnati, Ohio, February 27-March 5, 1957.

Central Surgical Association, Chicago, Illinois, February 21-23. Dr. Charles D. Branch, Secretary, 102 North Street, Peoria, Illinois.

Chicago Regional Committee on Trauma, American College of Surgeons, course on fractures and other trauma, April 10-13, 1957, John B. Murphy Auditorium, 50 East Erie Street, Chicago, Illinois. Dr. Sam Banks.

College of Medical Evangelists School of Medicine, 1957 Alumni Postgraduate Convention, Los Angeles, California, March 10-14, 1957. Refresher courses, March 10 and 11, giving Category I credit, American Academy of General Practice. Write: Managing Director, Alumni Postgraduate Convention, 316 North Bailey Street, Los Angeles 33, California.

First American Post-Graduate Assembly in Fertility and Sterility, New York Medical College-Metropolitan Medical Center, May 18-31. Dr. Ralph E. Snyder, Dean, New York Medical College, 1249 Fifth Avenue, New York 29, New York.

Twenty-Sixth Venereal Disease Postgraduate Conference, University of Tennessee College of Medicine, April 18-20. Dr. Henry Packer, Department of Preventive Medicine, University of Tennessee College of Medicine, Memphis 3, Tennessee.

University of Texas Postgraduate School of Medicine, Course in Rheumatic Diseases, Houston, Texas, February 27 through March 1. The University of Texas Postgraduate School of Medicine, Texas Medical Center, Houston 25, Texas.

International

Canadian Medical Association, Edmonton, Alberta, Canada, June 17-21. Dr. A. D. Kelly, 150 St. George Street, Toronto 5, Ontario, Canada.

College of General Practice, Montreal, Quebec, Canada, March 4-6. Dr. W. V. Johnston, 175 St. George Street, Toronto 5, Ontario, Canada.

Congress of International Anesthesia Research Society, Phoenix, Arizona, April 1-4. Dr. A. William Friend, Wade Park Manor, Cleveland 6, Ohio.

Congress of International Association for Study of the Bronchi, Lisbon, Portugal, May 25-26. Prof. F. Lopo de Varvalho, 138 rua de Junqueira, Lisbon, Portugal.

Congress of International Society for Cell Biology, St. Andrews, Fife, Scotland, August 28-September 3. Prof. H. G. Callan, Bell Pettigrew Museum, The University, St. Andrews, Fife, Scotland.

Congress of International Society of Orthopedic Surgery and Traumatology, Barcelona, Spain, September 16-21. International Society of Orthopedic Surgery and Traumatology, 34 rue Montoyer, Brussels, Belgium.

Congress of International Society of Surgery, Mexico City, Mexico, October 27-November 2. Dr. L. Dejardin, 141 rue Belliard, Brussels, Belgium.

Inter-American Congress of Pan American Medical Association, Mexico City, Mexico, November 18-22. Dr. Joseph J. Eller, 745 Fifth Avenue, New York 22, New York.

Interim Congress of Pan American Association of Ophthalmology, New York, April 7-10. Dr. Brittain F. Payne, 17 East 72nd Street, New York 21, New York.

International Conference on Audiology, St. Louis, Missouri, May 13-16. Dr. S. Richard Silverman, 818 South Kingshighway, St. Louis, Missouri.

International Congress of Clinical Pathology, Brussels, Belgium, July 15-20. Prof. M. Welsch, Universite de Liege, 32 Blvd. de la Constitution, Liege, Belgium.

International Congress of Dermatology, Stockholm, Sweden, July 31-August 6. Dr. C. H. Floden, Karolinska, Sjukhuset, Hudkliniken, Stockholm 60, Sweden.

International Congress of Electroencephalography and Clinical Neurophysiology, Brussels, Belgium, July 21-28. Dr. R. G. Bickford, Mayo Clinic, Rochester, Minnesota.

International Congress of International Society of Bronchoesophagology, Philadelphia, Pennsylvania, May 12-13. Dr. Chevalier L. Jackson, 3401 North Broad Street, Philadelphia.

MEETING AND ANNOUNCEMENTS

International Congress on Medicine and Surgery, Turin, Italy, June 1-9. Secretariat, Minerva Medica, Corso Bramante 83-85, Turin, Italy.

International Congress of Neurological Sciences, Brussels, Belgium, July 21-28. Dr. Pearce Bailey, National Institutes of Health, Bethesda 14, Maryland.

International Congress of Neurosurgery, Brussels, Belgium, July 21-28. Dr. William B. Scoville, 85 Jefferson Street, Hartford, Connecticut.

International Congress of Neuropathology, Brussels, Belgium, July 21-28. Dr. Ludo J. Bogaert, 47 rue de l'Harmonie, Antwerp, Belgium.

International Congress of Nutrition, Paris, France, July 24-29. Congress International de Nutrition, 71 Blvd. Pereire, Paris 17e, France.

International Congress of Otolaryngology, Washington, D. C., May 5-10. Dr. Paul H. Molinger, 700 North Michigan Avenue, Chicago 11, Illinois.

International Congress on Rheumatic Diseases, Toronto, Ontario, Canada, June 23-28. International Congress on Rheumatic Diseases, P.O. Box 237, Terminal "A," Toronto, Ontario.

International Gerontological Congress, Merano-Bolzano, Italy, July 14-19. Segreteria, Quarto Congresso Internazionale de Gerontologia, Viale Morgagni, 85, Firenze, Italy.

International League Against Epilepsy, Brussels, Belgium, July 21-28. Dr. Radermecker, Institut Bunge, 59 rue Philippe Milliot, Berchem, Antwerp, Belgium.

International Scientific Congress of International Congress of Surgeons, University, Mexico D.F., Mexico, Feb. 24-28. Secretary, Mexican Congress, International Congress of Surgeons, 1516 Lake Shore Drive, Chicago 10, Illinois.

International Symposium on Medical-Social Aspects of Senile Nervous Diseases, Venice, Italy, July 20-21. Secretariate, Viale Morgagni 85, Firenze, Italy.

International Voice Conference (Laryngeal Research Function and Therapy), Chicago, Illinois, May 20-22. Dr. Hans von Leden, 30 North Michigan Avenue, Chicago 2, Illinois.

Neuroradiologic Symposium, Brussels, Belgium, July 21-28. Professor Melot, Hôpital Universitaire St. Pierre, Brussels, Belgium.

Pan-Pacific Surgical Association, seventh congress, Honolulu, Hawaii, November 14-22, 1957. Write Dr. F. J. Pinkerton, director-general of the Pan-Pacific Surgical Association, Room 230, Young Building, Honolulu, Hawaii.

HARVEY TERCENTENARY CONGRESS

Since June, 1957, marks the tercentenary of the death of William Harvey, the discoverer of the circulation of the blood, the date will be commemorated by holding an International Congress on the Circulation, June 3 to 7, at the Royal College of Surgeons in London. The theme of the congress will be "A Review of the Present Knowledge of the Circulation," and the following subjects will be presented by world authorities in this field: Progress in knowledge of circulation from

the seventeenth century to the present time; the role of the heart in circulation; the results of cardiac surgery; coronary, pulmonary, fetal, cerebral, spanchic and peripheral circulation. Following the congress, a week-end conference on the more personal and biographical aspects of William Harvey's life will be held at his birthplace, Folkestone, Kent. Dr. F. A. Willius of the Mayo Clinic will be one of the participants in the congress. Further information may be obtained from the Congress Secretary, 11 Chandos Street, Cavendish Square, London W1, England.

MAYO CLINIC TO PRESENT CLINICAL REVIEWS

Once again the staff members of the Mayo Clinic and the Mayo Foundation will present a three-day program of lectures, discussions and demonstrations on problems of current interest in general medicine and surgery. There are no fees for this program which will be held on April 1, 2, and 3, 1957, and up to twenty-one hours of Category I credit may be obtained by the American Academy of General Practice members who attend. Attendance is limited, and those interested should communicate with Mr. R. C. Roesler, Mayo Clinic, Rochester, Minnesota.

FELLOWSHIPS FOR VACATION TIME STUDY FOR MEDICAL STUDENTS

The National Foundation for Infantile Paralysis has available a limited number of fellowships for medical students who wish to take advantage of vacation time for study during the calendar year, 1957. The program, administered by the Foundation through the deans of the medical schools, provides six fellowships for each approved medical school, two in each of the following categories: (1) research in the biologic and physical sciences related to medicine; (2) public health and preventive medicine; and (3) rehabilitation. Students must have completed one year toward the M.D. degree in order to be eligible for the research program. Application forms should be requested from the Dean of the Medical School where the student is enrolled. Further information may be obtained from Professional Education Division, National Foundation for Infantile Paralysis, 120 Broadway, New York 5, New York (after March 1, 301 East 42nd Street, New York 17).

STATE MEDICAL ASSOCIATION OFFICERS ANNOUNCED

Dr. J. Arnold Bargen, Rochester, took office as president of the Minnesota State Medical Association, January 1, succeeding Dr. R. H. Wilson, Winona. Dr. R. L. Page, St. Charles, is first vice president; Dr. W. E. Wellman, Rochester, second vice president, and Dr. B. B. Souster, St. Paul, was renamed secretary.

Dr. Donald McCarthy, Minneapolis, is treasurer, and Dr. H. M. Carryer, Rochester, speaker of the House of Delegates. Dr. C. L. Oppegard, Crookston, and R. R. Rosell, St. Paul, have been renamed chairman of the Council and executive secretary, respectively.

New members of the Council include Dr. W. B. Wells, Jackson, second district; Dr. C. G. Sheppard,

Hutchinson, fourth district; Dr. J. P. Medelman, St. Paul, fifth district. Dr. J. M. Stickney, Rochester, represents the first district; Dr. P. E. Hermanson, Hendricks, the third district; Dr. H. B. Sweetser, Minneapolis, the sixth district; Dr. W. W. Will, Bertha, the seventh district; Dr. C. L. Oppegard, Crookston, the eighth district, and Dr. Clarence Jacobson, Chisholm, the ninth district.

MEDICAL CONTINUATION COURSES AT UNIVERSITY OF MINNESOTA

The following medical continuation courses will be presented at the Center for Continuation Study, University of Minnesota, during the first quarter of 1957:

February 7-9—Cardiovascular Diseases for General Physicians

February 11-13—Anesthesiology for General Physicians

February 11-16—Neurology for General Physicians and specialists

March 4-6—Internal Medicine for Internists

March 18-20—Pediatrics for General Physicians

March 21-23—Obstetrics for Specialists

April 6—Trauma for General Physicians

April 8-10—Radiology for General Physicians

Details about these courses may be obtained from the Director, Department of Continuation Medical Education, 1342 Mayo Memorial, University of Minnesota, Minneapolis 14, Minnesota.

INTERNATIONAL PRIZES FOR FAMILY PHYSICIANS

A new series of prizes for family physicians of any country has been announced in London by Benger Laboratories, British pharmaceutical firm. The prizes which total 500 pounds in value will be known as the "Benger Prizes for Original Observations in General Practice." The ideas for which the pharmaceutical firm is looking may be concerned with the cause, diagnosis, treatment or prevention of any disease, and all entries will be published in a book available to physicians everywhere. The company believes "that among the obscure and unassuming family doctors of the world there may be another Jenner or another Lind." Entries may be in any form and of any length, and manuscripts or correspondence should be addressed to Benger Laboratories, Ltd., Holmes Chapel, Cheshire, England. All family physicians are eligible to participants.

TUMOR CONFERENCE

(Continued from Page 44)

surgery and the lymph nodes examined in the specimen were negative for metastases. The parotid gland substance itself also was negative for residual tumor.

The practice of thoroughly searching any pa-

tient with a lump in the neck or parotid region for a possible primary cancer in the pharynx, larynx, oral cavity, et cetera, is very worthwhile. Many times a lesion with the clinical appearance of a probable primary parotid tumor can be approached with the knowledge that it most likely represents a metastasis after the primary tumor in the head and neck region has been demonstrated and proved. Under these circumstances, it is possible to establish a somewhat more rational and beneficial course of therapy for the patient.

BLEEDING FROM THE GENITO-URINARY TRACT

(Continued from Page 20)

entire defect was roofed with organized hematoma. Microscopic examination of the kidney revealed large areas of necrosis and a renal infarct. The patient had a normal convalescence.

Summary

Hematuria should always be investigated promptly because of the high incidence of serious and yet curable conditions causing it. Many traumatic injuries to the kidney may be treated conservatively if they are observed carefully and good judgment is exercised. There is no routine therapeutic procedure applicable to all cases; each case must be carefully individualized. Evidence of severe renal damage out of proportion to the degree of trauma should arouse suspicion of a pre-existing renal disease. Six patients with serious injuries to various parts of the urinary tract are briefly described, all helped by timely surgical intervention. It is hoped that this review of bleeding from the genitourinary tract will serve as a reminder of the seriousness of the symptom.

References

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2. Higgins, C.: Significance of hematuria. *Modern Med.*, 22: 81-84 (Oct. 1) 1954.
3. Davis, S. W., and Davis, E., Jr.: Gross urinary hemorrhage: a symptom not a disease. *J.A.M.A.*, 153: 782-784 (Oct. 31) 1953.
4. Doss, A. K.: Hematuria. *Urol. & Cutan. Rev.*, 51: 676-680 (Dec.) 1947.
5. Nation, E.; Butts, E. M.; Massey, B.; and Gallup, C.: Palindromic unilateral renal purpura: an explanation for renal hematuria of obscure origin. *J. Urol.*, 68:74-87 (July) 1952.
6. Sargent, J., and Marquard, C.: Renal injuries: *J. Urol.*, 63:1-8 (Jan.) 1950.

Woman's Auxiliary

NATIONAL PRESIDENT TO SPEAK AT STATE BOARD MEETING

The mid-winter board meeting of the Woman's Auxiliary to the Minnesota State Medical Association will be held at 10:00 a.m. Wednesday, January 23, at the Minnesota Club in St. Paul. Registration for the meeting will be at 9:30.

Guest speaker is the national Auxiliary president, Mrs. Robert Flanders, Manchester, New Hampshire.

Mrs. Flanders first served on the board of directors of the Woman's Auxiliary to the American Medical Association as fourth vice president and chairman of the organization committee of the Eastern Region in 1948-1949. She was a director for two years, 1950-1952, and was chairman of the revisions committee in 1952-1953. She has served the Auxiliary on both the finance and executive committees. She was first vice president and chairman of the organization committee for two years, 1953-1955, and was the president-elect in 1955-1956.

In 1944-1946, she was president of the Woman's Auxiliary to the New Hampshire Medical Society and in 1930-1931 she served as president of the Woman's Auxiliary to the Hillsboro County Medical Society.

Mrs. Flanders' interests are many and varied. She has served as president of a number of organizations in her community including the Manchester Girls' Club, the Junior Associates of Elliott Hospital, Senior Associates of Elliott Hospital, and the Woman's Union of Franklin Street Church.

Her family consists of her husband, two daughters, two sons and four grandchildren. One of her sons is a physician in Indianapolis, Indiana.

NEWS FROM COUNTY AUXILIARIES

Hennepin

Mrs. L. P. Howell, Rochester, state president, was guest of honor at a Christmas luncheon meeting held at the Interlachen Country Club in Minneapolis, December 7.

Mrs. A. Cabot Wohlrabe, Minneapolis, sang a group of Christmas carols from a number of nations—Italy, Germany, France—including a Chinese lullaby. She was accompanied by Mrs. Russell Lindgren whose two young daughters, Ann and Mary, sang a group of Christmas songs. The youngsters were dressed as angels and carried lighted candles.

Approximately 135 members attended this Christmas program. A silver offering was taken for the Sarahurst Home for convalescing tuberculosis patients located in Minneapolis.

* * *

Mrs. Reuben Erickson presented the awards for the 1956 high school Tuberculosis Essay contest over radio station WCCO, Minneapolis, Saturday, December 8, and Saturday, December 15. She represented the Minnesota Auxiliary which co-sponsored the contest. Mrs. Wallace Ritchie, St. Paul, a member of the Ramsey County Auxiliary, assisted in the judging. The winners

in the senior high group were Mary Powelson, St. Cloud, Marlene Fischer, Pierz, and Kathleen Redpath, St. Paul. Karen Thorp, Duluth, and Carol Hudoba, New Brighton, won the junior high division.

* * *

A Hennepin Auxiliary committee headed by Mrs. Karl Anderson is developing a program for wives of medical students at the University of Minnesota. The committee is working with the Student AMA group at the University.

The Minneapolis District Dental Auxiliary entertained members of the Hennepin County Medical Auxiliary at a Christmas tea at the Prudential Life Insurance Building in Minneapolis, December 10. Mrs. Waldemar Johanson, St. Paul, member of the Ramsey County Medical Auxiliary, spoke on "Candles for Christmas." At the end of her talk, guests at the tea received candles which had been made by Mrs. Johanson.

Lyon-Lincoln

Lyon-Lincoln Auxiliary elected new officers in November: Mrs. John Myers, Canby, president; Mrs. Leonard Monson, Canby, secretary-treasurer. Mrs. M. I. Hauge, Clarkfield, was the speaker at the November meeting.

Red River Valley

Members of the Red River Valley Auxiliary held a joint dinner meeting with their husbands in Thief River Falls in November. After dinner, the Auxiliary members adjourned to the home of Dr. and Mrs. M. D. Starekow for their own meeting.

Zumbro Valley (Olmsted-Houston-Fillmore-Dodge)

The O-H-F-D group from now on will be known as the Zumbro Valley Medical Society Auxiliary. The group was host to the Region 1 Auxiliary meeting in Rochester early in November. A luncheon was held at the Rochester Golf and Country Club and the afternoon meeting was held at the Mayo Foundation House.

Mrs. C. L. Sheedy, Austin, chairman of the advisory committee, read some original verses about duties of a member of the advisory board. A number of other state officers gave résumés of their jobs. A discussion period followed.

Mrs. G. R. Diessner is president of the Zumbro Valley group and Mrs. Howard F. Polley is first district adviser.

However successful our treatment of tuberculosis in children and young adults may be, unless we control the disease in the higher age groups we shall be a long time reducing the incidence of the disease in the population. The active cases in elderly men and women are going to form the hard core of infection in the community that may give rise to local epidemics of acute cases among the young contacts. It behooves us, therefore, to discover, treat, and if necessary isolate these dangerous old men and women and to do all we can to protect our children and young adults from the risks to which they are exposed.—F. R. G. Heaf, M.D., J. Royal Inst. Pub. Health and Hygiene, November, 1955.

In Memoriam

CARL E. ANDERSON

Dr. Carl E. Anderson, who practiced medicine in Brainerd for a number of years, died October 22, 1956, in Moose Lake, Minnesota. He was sixty-three years old.

Born in South Dakota in 1893, Dr. Anderson received his medical education at the University of Minnesota. At one time he was chief of staff of St. Joseph's Hospital in Brainerd. He was a member of the Upper Mississippi Medical Society, the Minnesota State Medical Association and the American Medical Association. He had also practiced in Great Falls, Montana.

Survivors include his wife, Evelyn.

FREDERICK H. DUBBE

Dr. F. H. Dubbe, New Ulm, Minnesota, physician and surgeon, died November 30, 1956. He was sixty-one years old.

Born at Jordan, Minnesota, April 27, 1895, Dr. Dubbe graduated from Carleton College, Northfield, Minnesota, and received his medical education at the University of Minnesota. He interned at Minneapolis General Hospital, and at Northwestern Hospital, Minneapolis, and began practicing in New Ulm in 1920.

A member and past president of the Brown County Medical Society, Dr. Dubbe also belonged to the Southern Minnesota Medical Association, the Minnesota State Medical Association, the American Medical Association, and was a Fellow of the American College of Surgeons. He was also a member of the Brown County and Minnesota State Historical Societies, the Izaak Walton League, and the New Ulm Civic and Commerce Association. Dr. Dubbe was a charter member of the New Ulm Lions Club.

Survivors include his wife, Lillian, and two brothers, Emil and Carl, Jordan, Minnesota.

EDWIN G. KNIGHT

Dr. Edwin G. Knight, physician at Swanville, Minnesota, since 1943, died November 29, 1956, at Mounds Park Hospital, St. Paul. He was forty-two years old.

Dr. Knight was born in Randall, Minnesota, and graduated from St. Cloud Technical High School. He attended Macalester College, St. Paul, Jamestown College, Jamestown, North Dakota, and graduated from the University of Minnesota Medical School. Following his graduation, he practiced in Randall for a number of years.

From 1943 to 1951, he practiced with Dr. Edwin J. Simons in Swanville and had been alone since Dr. Simons moved to Minneapolis in 1951.

A member of the Upper Mississippi Medical Society, Dr. Knight also belonged to the Minnesota State Medical Association and the American Medical Association.

Survivors include his two children, Douglas, twelve, and Marcia, eleven; his stepmother, Mrs. S. G. Knight,

Swanville; one brother, Robert, Palo Alto, California; one sister, Mrs. Virgil Miller, Proctor, Minnesota. His wife preceded him in death less than a year ago.

MORRIS H. LAX

Dr. Morris H. Lax, St. Paul physician for more than thirty years, died in November, 1956. He was sixty-two years old.

Dr. Lax was born in Warsaw, Poland, in December, 1893. After emigrating to the United States, he attended St. Paul Mechanic Arts High School and the University of Minnesota, where he received his degree in medicine in 1922. He interned at Minneapolis General Hospital and opened a private practice in St. Paul. His field of special interest was proctology.

A member of the Ramsey County Medical Society, Dr. Lax also belonged to the Minnesota State Medical Association and the American Medical Association.

Survivors include his wife, Marian, St. Paul.

GEORGE H. MESKER

Dr. George H. Mesker, pioneer physician of Olivia, Minnesota, died November 19, 1956. He was eighty-three years old.

Dr. Mesker was born in Sibley County, July 10, 1873. He attended high school at Henderson and graduated from the University of Minnesota medical school. After practicing for one year at Chokio, he moved to Olivia in 1897.

During World War II, he served with the U. S. Army medical corps in Savage, Minnesota, Pueblo, Colorado, and St. Louis, Missouri. In 1945, he returned to Minnesota and served for four years as a member of the staff of Cambridge State Hospital. In 1949, he moved back to Olivia.

Dr. Mesker served as a member of the board of education in Olivia for thirty-three years and was president for several terms. He was also village mayor and had served on the village council.

As first president of the Renville-Redwood County Medical Society, Dr. Mesker also belonged to the Minnesota State Medical Association which counted him among its "50 Club" members. He was also a member of the American Medical Association and a board member and past president of Riverside Sanatorium Committee.

Survivors include his wife, Florence; one son, Clifford, St. Louis, Missouri; one daughter, Mrs. James Baker (Florence), Munster, Indiana; six grandchildren, and one sister, Mrs. Lizzie Lindenberg, Sunnyside, Washington.

DAVID E. NELSON

Dr. David E. Nelson, Alexandria physician and surgeon for many years, died November 11, 1956. He was seventy-four years old.

IN MEMORIAM

Dr. Nelson was born in Anoka, Minnesota, August 17, 1882. He attended the Anoka and St. James, Minnesota, schools, Valparaiso University, Valparaiso, Indiana, and received his medical education at the Chicago College of Medicine and Surgery. He interned at Cook County Hospital, Chicago, and served in the U. S. Army Medical Corps during World War I.

Dr. Nelson had also practiced medicine in Chicago, Brainerd and Minneapolis.

He served as health officer for the city of Alexandria at one time and had been a member of the Park Region District and County Medical Society, the Minnesota State Medical Association, and the American Medical Association.

GEORGE H. NORRIS

Dr. George H. Norris, physician in Annandale, Minnesota, for fifty-two years, died November 29, 1956. He was eighty-six years old.

Dr. Norris was born in Hamilton, Canada, and received his medical education at the University of Michigan. He practiced in Clearwater, Minnesota, for two years before moving to Annandale in 1904.

A member of the Masonic Lodge of Annandale, Dr. Norris was also the first commander of the Annandale American Legion Post. He served as a major in the U. S. Army Medical Corps during World War I.

At one time, he was a member of the Wright County Medical Society and the Minnesota State Medical Association.

He is survived by one daughter, Mrs. Frances Heindinger, Tulsa, Oklahoma, and three sons, George S., Houston, Texas; Robert B., Minneapolis, and Dr. Neil T., Caledonia, Minnesota.

CHARLES SIMON RAADQUIST

Dr. Charles S. Raadquist, Hibbing physician for nearly forty years, died November 9, 1956. He was seventy-two years old.

Dr. Raadquist was born at Warren, Minnesota, November 21, 1883. He graduated from the University of Minnesota medical school in 1915 and took post-graduate work at Ancker Hospital, St. Paul, and Post-graduate Hospital, Chicago.

A member of the staff of the Adams Clinic in Hibbing, Dr. Raadquist was also a member of the Range Medical Society, the St. Louis County Medical Society, the Minnesota State Medical Association and the American Medical Association.

Dr. Raadquist was chief of staff at Hibbing General Hospital and at one time was health officer for the Village of Hibbing. He was a member of Wesley Methodist church, the Rotary and Kiwanis Clubs, Mesaba Lodge No. 225, A.F.&A.M., Iron Range Lodge of Perfection, and a member of the American Legion as a veteran of World War I.

Survivors include his wife, Pauline; a brother, Carol W. Raadquist, Minneapolis, and a nephew, Clinton Raadquist, also of Minneapolis.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

TWO SENTENCED AT LE CENTER FOR ABORTION

Re: State of Minnesota vs. James Jerome Meyers and LaDess Weinand

On November 30, 1956, James Jerome Meyers, twenty-four, a radio technician at Le Center, and LaDess Weinand, eighteen, 3862 Orchard Avenue North, Robbinsdale, appeared before the Hon. Harold Flynn, Judge of the District Court at Le Center, and were sentenced for the crime of abortion. The defendant Meyers was sentenced to serve a term of not to exceed four years in the State Reformatory for Men at St. Cloud. Miss Weinand was sentenced to the custody of the Youth Conservation Commission for a period of not to exceed four years, but Judge Flynn suspended the sentence and placed her on probation for a period of two years. Both defendants had previously entered a plea of guilty to the abortion charge before Judge Flynn on October 29, 1956, at which time a pre-sentence investigation was ordered by the court.

The defendant Meyers admitted in a signed statement which he gave to the authorities that he was responsible for the pregnancy of Miss Weinand. He further stated that, after unsuccessful attempts to have her aborted by other means, he advised the defendant Weinand to jump from the top of a refrigerator in his home. Miss Weinand followed his advice and the following day, September 28, 1956, she aborted.

While being questioned by Judge Flynn prior to being sentenced, Meyers admitted that he had been convicted of car theft in Aberdeen, South Dakota, on November 15, 1949, at which time he was given a suspended sentence of two years and placed on probation for the same period of time. He also admitted a conviction for using an automobile without the owner's permission on April 13, 1950, and that he was sentenced to serve a term of not to exceed five years in the State Reformatory for Men at St. Cloud, Minnesota. The defendant was released from the reformatory on April 10, 1952. In addition Meyers stated to Judge Flynn that he had been convicted of auto theft again in May, 1952, at Winona, Minnesota, being sentenced at that time to serve a sentence of from one to twenty years, also at the State Reformatory for Men. Meyers served slightly over two years of his sentence until June 23, 1954, when he was allowed to leave the reformatory on parole.

PRIOR LAKE WOMAN SENTENCED FOR OBTAINING NARCOTICS BY MEANS OF FORGED PRESCRIPTION

Re: State of Minnesota vs. Mildred Martha Mueller

On November 29, 1956, Mrs. Mildred Martha Mueller, forty, Route #2, Prior Lake, was sentenced by the Hon. Theodore B. Knudson, Judge of the District Court of Hennepin County, to a term of not to exceed five years at the State Reformatory for Women, Shakopee, for the crime of obtaining narcotics by the forgery of a prescription. Previously, on October 16, 1956, the defendant had entered a plea of guilty before Judge Knudson to an information charging her with that offense. However, Judge Knudson suspended the sentence and placed Mrs. Mueller on probation for a period of two years, one of the conditions of her probation being that she consult a doctor of medicine once each month and also authorize a report in reference to her physical condition to be sent by that doctor to the Hennepin County Probation Office.

The defendant, who has no prior criminal record, had been obtaining prescriptions for morphine sulphate from a Minnesota physician but when he refused to write further prescriptions for her, she forged the physician's name to prescriptions for morphine sulphate, which were written by her on plain white slips of paper. After a number of these prescriptions had been presented in August, 1956, at a Minneapolis drug store and narcotics obtained thereon by Mrs. Mueller, the pharmacist became suspicious and notified the authorities. A representative of the Minnesota State Board of Medical Examiners then contacted the physician whose signature had been forged and the physician, after inspecting the various prescriptions, gave a signed statement at the Minneapolis Police Department in which he said that the signatures on the various prescriptions were not his. A criminal complaint, which was signed by the Medical Board's representative, was then issued by the Hennepin County Attorney's Office and Mrs. Mueller was apprehended and placed in jail. However, Mrs. Mueller became ill and was hospitalized at Minneapolis General Hospital until October 8, 1956.

TWO MINNEAPOLIS MEN SENTENCED FOR ABORTION

Re: State of Minnesota vs. Walter John Rapacz and Harland K. Springer

On October 26, 1956, Harland K. Springer, thirty-four, 6321 Clinton Avenue, Richfield, was sentenced by the Hon. Levi M. Hall, Judge of the District Court of Hennepin County, to a term of not to exceed four years in the Minnesota State Prison at Stillwater, pursuant to his plea of guilty, which Springer had previously entered on August 29, 1956, to an information charging him with the crime of abortion. However, Judge Hall stayed the execution of the sentence for a period of five years and placed the defendant on probation during this time.

The defendant Rapacz, thirty-two, 4327 Cedar Avenue, Minneapolis, who was charged with the same offense, entered a plea of not guilty before Judge Irving R. Brand of Hennepin County District Court on August 1, 1956, and the case was set for trial. On September 28, 1956, the trial of Rapacz by jury commenced before Judge Brand. The defendant took the witness stand in his own behalf during the course of the trial and asserted as an alibi that on July 11, 1956, the day that the abortion took place, he was working at his job at an automobile company on Lake Street in Minneapolis and therefore could have taken no part in the crime. It was not the claim of the prosecution that Rapacz performed the abortion but that he had transported the patient, a thirty-four-year-old Minneapolis divorcee with three children, to the place where the illegal operation was performed and also that the money paid for the abortion was paid to him. The person who was charged with actually performing the abortion was found not guilty by a jury in a separate trial. The evidence at the Rapacz trial disclosed that the sum of \$250 was paid for the abortion, of which the defendant Springer paid \$230 and the woman who submitted to the abortion paid the remainder. The case came to the attention of the authorities when the patient became ill and was hospitalized in a Minneapolis hospital.

The defendant Rapacz at the conclusion of the trial was found guilty by the jury, and Judge Brand at that time referred the case to the Hennepin County Probation Office for a pre-sentence investigation. On November 15, 1956, Rapacz appeared before Judge Brand for sentencing, but upon being questioned about the crime Rapacz still denied his guilt so Judge Brand directed that the defendant should be given a lie detector test. However, later on that same date, Rapacz had a change of heart

and again appeared before Judge Brand and admitted that he had a part in the abortion, whereupon he was sentenced to a term of seven years at the State Prison at Stillwater. However, Judge Brand stayed the execution of the sentence and placed the defendant on probation for a period of five years.

Rapacz has three prior convictions as follows: On May 5, 1942, he was convicted in the United States District Court in Minneapolis of stealing and forging United States postal money orders, at which time he was placed on probation until June 3, 1945. On February 10, 1943, the Hon. Paul N. Guilford, Judge of the District Court of Hennepin County, sentenced Rapacz to a term of not to exceed eighteen months in the State Reformatory for Men at St. Cloud, upon his conviction of the offense of burglary in the third degree. The defendant was released from that institution on May 10, 1944, to the custody of the United States Marshal for a violation of his probation. On July 26, 1946, Rapacz was convicted in the District Court of Hennepin County of the offense of forgery in the second degree, whereupon Judge Levi M. Hall sentenced him to serve two and one-half years in the Minnesota State Prison at Stillwater.

MANAGEMENT OF INFECTIOUS HEPATITIS

(Continued from Page 39)

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27. Kalfskin, G., and Rappaport, R. M.: Late residuals in presumably cured acute infectious hepatitis. *Ann. Int. Med.*, 26:13-25, 1947.
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General Interest

Dr. and Mrs. A. E. Brown of Oronoco returned November 3 from a two-month tour of hospitals and clinics in Europe. Dr. Brown is a staff member of the Mayo Clinic.

* * *

The American Medical Women's Association has named **Dr. Helen Knudsen**, chief of hospital services for the Minnesota Department of Health, as "Medical Woman of the Year." Under her direction, more than \$16 million of federal aid has been spent in Minnesota's Hill-Burton hospital program, and more than fifty-five hospitals and public health centers have received aid from this fund.

* * *

Dr. John Coe, Minneapolis General Hospital and president of the Minnesota Society of Clinical Pathologists, was an honored guest at the November 13 meeting of the Minnesota Society of Medical Technologists at the University of Minnesota Center for Continuation Study. The latter organization also held a continuation course in clinical chemistry for technologists, at which **Drs. Paul Hagen**, Minneapolis Veterans Hospital, **James Melby** and **Frederick Goetz**, University of Minnesota hospitals, served on the faculty.

* * *

Dr. John S. Siegel of Virginia, and **Dr. E. R. Addy** of Gilbert attended a one-week course in modern therapeutics in Chicago, at which lecturers came from the University of Chicago, Northwestern University Medical School, University of Minnesota, and Duke University.

* * *

Dr. Louis A. Buie, Rochester, received mention in the December 11, 1956 issue of *Look* magazine in an article devoted to the proposed revised principles of medical ethics. Dr. Buie is chairman of the AMA Council on Constitution and By-laws, which was given the task of revising the Principles.

* * *

The second annual Golden Deeds Award of the Rochester Exchange Club was presented on November 27 to **Dr. Arthur H. Sanford** of Rochester. Dr. Sanford's years of unselfish service on the School Board, Library Board, Olmsted County Historical Society and in the Boy Scouts, as well as many personal "golden deeds" to friends and neighbors, formed the basis for his selection. Dr. Sanford, who is now director of laboratories at Rochester State Hospital, was retired from the Mayo Clinic as head of the section of clinical pathology in 1949, and is an emeritus member of the Clinic staff.

* * *

The Air Force Exceptional Service award was presented to **Dr. Donald A. Hastings** of the University of Minnesota Medical School, by Secretary of the Air Force **Donald A. Quarles**. This is one of four awards

given to scientists throughout the nation, and was given to Dr. Hastings for meritorious service to the Air Force from 1950 through 1955. Dr. Hastings has served as chairman of the aeromedical panel of the scientific advisory board to the Air Force chief of staff.

* * *

Dr. J. B. Erich of the Mayo Clinic, Rochester, was one of the speakers at a meeting of the American Fracture Association in Chicago in late November.

* * *

At the meeting of American Academy of Cerebral Palsy held in Chicago in November, the Mayo Clinic was represented by **Drs. D. J. Erickson**, **L. E. Harris**, **E. W. Johnson**, **R. G. Dickert** and **C. R. Sullivan**.

* * *

The newly-elected president of the voting staff of the Mayo Clinic is **Dr. H. J. Moersch**, chairman of the sections of internal medicine, and professor of Medicine in the Mayo Foundation. Other new officers for 1957 are **Drs. L. M. Eaton**, vice president; **C. A. Owen, Jr.**, secretary; and **O. S. Culp** and **R. L. Parker**, councilors. **Drs. H. B. Burchell** and **C. A. Good** will replace **Drs. S. F. Haines** and **T. B. Magath** on the board of governors of the Clinic. **Dr. J. A. Borgen**, retiring president of the staff, and **Dr. Victor Johnson**, director of the Mayo Foundation, both addressed the group. Two retiring members, **Dr. L. T. Austin**, senior consultant and formerly head of the section of dentistry, and **Dr. A. C. Davis**, consultant in medicine, both received scrolls.

* * *

Dr. A. D. Fetzek, physician and surgeon, has begun the practice of medicine in Austin, having completed his service with the Air Force.

* * *

Dr. C. Gordon Vaughn, who is limiting his practice to dermatology, opened new offices at 1065 Lowry Medical Arts Building, St. Paul, on December 1.

* * *

A Minnesota-born physician, **Dr. Edward M. Gans**, formerly of Eveleth, was honored by the American Medical Association by being named the nation's outstanding family doctor of the year. A graduate of the University of Minnesota, Dr. Gans now resides in Harlowton, Montana, where he serves the range country in central Montana.

* * *

Dr. H. Z. Giffin has the honor of being the first member to have reached the fiftieth anniversary of his joining the Mayo Clinic staff. He became affiliated with the Clinic in 1906 and became an emeritus staff member in 1946.

* * *

At the National Conference of Editorial Writers, held in Minneapolis, November 14 through 17, **Dr. Charles W. Mayo** of Rochester, United States delegate to the United Nations, was the banquet speaker. He stressed

the fact that if medical research is to advance, those engaged in the various research fields must have ready access to the clinician, the surgeon, and the patient, and that the areas of medical research and the actual practice of medicine are no longer separate spheres of interest.

* * *

On Thursday, November 8, **Dr. L. O. Underdahl** of the Mayo Clinic addressed the annual meeting of the Minnesota Dietetic Association on the subject of "The Use of Oral Hypoglycemic Agents in the Treatment of Diabetics."

* * *

Dr. H. Waltman Walters, surgeon at the Mayo Clinic and rear admiral in the medical corps, U. S. Naval Reserve, was the convocation speaker at Shattuck School, Faribault, Tuesday, November 13. He addressed the students on the subject of "Medicine as a Career."

* * *

Drs. George Baker and **Alfred Uihlein**, both of the section on Neurological Surgery of the Mayo Clinic, presented papers at the eighteenth annual meeting of the American Academy of Neurological Surgery in Phoenix, Arizona, November 7 to 11. Dr. Baker discussed plastic neurosurgical procedures on the scalp and skull, and Dr. Uihlein outlined fractional and pneumoencephalography. Dr. Baker was elected vice president of the organization.

* * *

Dr. and Mrs. Coolidge S. Wakai are at home in Rochester following their marriage in Los Angeles, October 27. Dr. Wakai is a fellow at the Mayo Foundation, and his bride, the former **Edith S. Yamasaki** of Los Angeles, was a social worker prior to her marriage.

* * *

Dr. Benedik Melby, octogenarian and beloved family physician of Blooming Prairie, accompanied by his wife, spent three weeks traveling in the East, visiting New York, Washington, and Detroit, during the early fall.

* * *

The community of Frost paid tribute on November 18 to **Dr. Lewis E. Hanson** on the twenty-fifth anniversary of his serving that community as a physician. Dr. Hanson has been active in civic and religious affairs in his area of practice which also includes Bricelyn, Minnesota, and Rake, Iowa.

* * *

To point up Diabetes Detection Week, the *Minneapolis Star* carried a two-column feature story of the work **Dr. Arnold Lazarow**, head of the Anatomy Department of the University of Minnesota, is doing with ten rhesus monkeys who have had diabetes for three years. Also reported was the experimental removal of the pituitary gland in two middle-aged men threatened with blindness as a complication of diabetes, in both of whom insulin requirements have now dropped sharply.

* * *

Partners in the new Koronis Medical Center at Paynesville are **Drs. Thomas E. Vanderpool** and **Kermit J. Halverson**, both graduates of the University of Minnesota School of Medicine.

The North Central Medical Conference in its annual meeting in St. Paul named **Dr. R. G. Mayer**, Aberdeen, South Dakota, as president-elect. This organization is composed of physicians from Iowa, Minnesota, Nebraska, Wisconsin, North and South Dakota.

* * *

East Range Clinics at Aurora has recently established its fifth affiliated branch at Hoyt Lakes, with **Dr. Raymond J. Chittum** in charge. Other East Range Clinics are located in Virginia, Eveleth, Biwabik and Aurora.

* * *

Dr. Morris H. Lax, St. Paul physician and staff member of Bethesda Hospital, died of a heart ailment on November 21.

* * *

Aurora, Minnesota, turned out en masse on December 2 to pay tribute to **Dr. Ivor T. Dahlin**, beloved general practitioner and for years the lone physician in the Aurora area, on the occasion of his retirement from the active practice of medicine.

* * *

Dr. John N. Olinger, a specialist in obstetrics and gynecology, is now associated with **Dr. Louis A. Loes** in a new clinic in St. Cloud. Dr. Olinger, who is a junior member of the American College of Surgeons, graduated from the Northwestern University Medical School and served for two years in the U. S. Air Force.

* * *

The East Range Clinics have added to their staffs, **Dr. Leon K. McGill**, an obstetrician and gynecologist. While Dr. McGill will be primarily attached to the clinic in Virginia, he will also serve the branches of the clinic at Eveleth and Aurora.

* * *

The North Central Medical Conference at its annual meeting in St. Paul in mid-November, awarded **Dr. William F. Braasch**, emeritus member of the Mayo Clinic staff, a citation for his contributions to the welfare of medicine.

* * *

Newly elected officers of the Ramsey County Medical Society are **Drs. J. Allen Wilson**, president; **Francis W. Lynch**, president-elect; and **Edward C. Gibbs**, secretary-treasurer. **Dr. A. E. Ritt** is the outgoing president.

* * *

Dr. Joseph B. Gaida, St. Cloud, was inducted a Fellow of the International College of Surgeons (Eye) in Chicago, last September.

* * *

"Plastic and Reconstructive Surgery Using Skin Grafts and Flaps" was the subject presented by **Dr. Merrill D. Chesler**, Minneapolis, at the November 26, 1956 meeting of the Blue Earth County Medical Society at the Mankato Clinic.

* * *

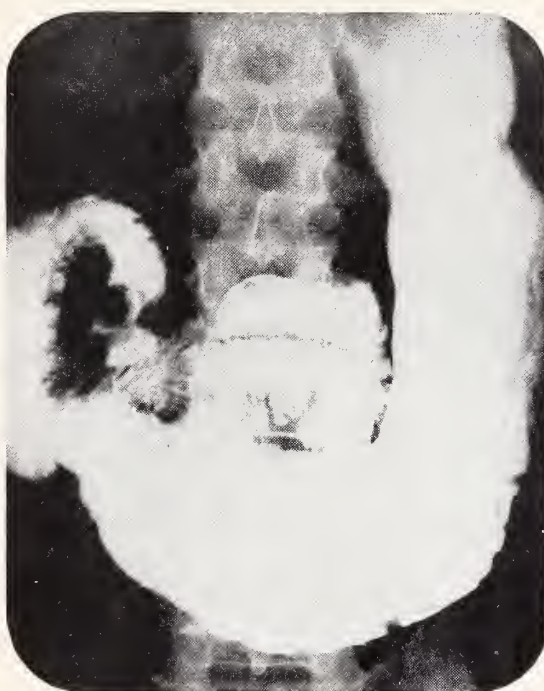
Dr. John J. Regan, Minneapolis, has been appointed attending psychiatrist at the Hamm Memorial Psychiatric Clinic. A graduate of St. Thomas College and the University of Minnesota Medical School, Dr. Regan served as a naval medical officer during World War II.

(Continued on Page A-38)

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(Continued from Page 76)

After completing his fellowship in psychiatry at the University of Minnesota, he served for a time as a staff member of the Minneapolis Veterans Administration Hospital. He has just returned from Hawaii where he was a supervising psychiatrist in the Territorial Hospital. Dr. Regan is a member of the American Psychiatric Association, a diplomate of the American Board of Psychiatry and Neurology, and is a clinical instructor at the University of Minnesota Medical School.

* * *

Dr. Joe R. Brown of the Mayo Clinic presented a paper at a meeting of the American Speech and Hearing Society in Chicago in late November, and represented the field of neurology at the annual workshop of the Conference of Rehabilitation Centers in Washington, D. C.

* * *

At the Seattle interim meeting of the American College of Chest Physicians, Dr. H. J. Moersch of Rochester presided and also acted as moderator of a chest disease conference, and Dr. A. M. Olsen, also of Rochester, presented a paper.

* * *

A number of staff members of the Mayo Clinic attended and participated in the interim session of the American Medical Association in Seattle, Washington, November 27-30, 1956. Drs. E. V. Allen, J. A. Borgen, R. R. Kierland, and F. H. Krusen were delegates, and Dr. Allen participated in a panel discussion. Other Clinic physicians taking part in the program were Drs. D. C. Dahlin, W. S. Fowler, C. H. Hodgson, W. F. Kvale, and A. M. Olsen. Others attending were Drs. G. R. Diessner, N. O. Hanson, and W. E. Wellman.

* * *

The Minnesota Heart Association conducted an orientation program for members of the Ramsey County Medical Society at Ancker Hospital, St. Paul, December 6. The program was arranged by Dr. John F. Briggs, chairman of the Minnesota Heart Association's professional education committee. Dr. William F. Mazzitello, director of postgraduate medical education at Ancker Hospital, conducted a tour of the research facilities and animal laboratories where studies of heart ailments are being conducted. Dr. Milton M. Hurwitz, St. Paul, vice president of the association, presided at a dinner meeting following the tour.

* * *

Dr. R. W. Koucky, Minneapolis, spoke at the second annual meeting of the Minnesota State Association of Blood Banks at the University of Minnesota, November 15, 1956.

* * *

The Steele County Medical Society, the Steele County Nursing Service and the Owatonna City Hospital are co-sponsoring a class for prospective parents at the Owatonna City Hospital.

* * *

Dr. L. W. Morsman, Hibbing, was honored by members and the auxiliary of the Range Medical Association at their annual meeting in Virginia recently. Dr.

Morsman has practiced medicine for fifty years. Judge James L. Underhill, Virginia, the main speaker at this meeting, discussed relations between the medical and legal professions.

* * *

Dr. George E. Thomas, Minneapolis, was honored at a luncheon recently on the occasion of his retirement from practice after fifty-one years. Dr. Thomas has had his office at the corner of Lake Street and Nicollet Avenue since 1905. A complete feature story on the doctor appeared in the November 29, 1956, issue of the *East Minneapolis Argus*.

* * *

Dr. Roger Johnson, Excelsior, Minnesota, was named chief of staff of the Waconia hospital at the annual meeting of the hospital in November. Dr. John Clarke, Watertown, was named vice-chief of staff and Dr. Charles Bean, Waconia, was named secretary-treasurer.

* * *

Dr. Vernon D. E. Smith, St. Paul, showed hunting and skiing movies at a sports program sponsored by the St. Paul Smith College Club in December.

* * *

Dr. Edgar V. Allen, Rochester, newly named president of the American Heart Association will open the Heart Fund drive in the Twin Cities in February. This appearance will be one of his 125 official visits during his year in office.

* * *

Dr. Charles L. Steinberg, St. Paul pediatrician, spoke on "Your Child Today" at a meeting of the Child Psychology Study Circle in St. Paul recently.

* * *

Dr. Nathan K. Jensen, Minneapolis, was featured in the December 7, 1956, edition of the *Minneapolis Star*. Dr. Jensen saved his son, Niels, and Phillip Contrain, a French exchange student living with the Jensens, from drowning on Medicine Lake early in December. The three were sailing in an iceboat on the lake when they hit a patch of open water and fell into the lake in water twenty feet deep.

* * *

New officers of the Association of Fellows of the Mayo Foundation were elected at the annual meeting of the group in Rochester in November.

Dr. William Spencer Payne is president; Drs. John U. Gardner, vice president; Dr. Donald F. Phillips, secretary; Dr. John W. Vance, treasurer, Dr. D. L. Tuffanelli, athletic chairman, and Dr. Robert J. Spencer, social chairman.

* * *

Drs. William H. Hengstler and Frank Babb, St. Paul, took part in a panel discussion on medical-legal problems at a joint meeting of the Ramsey County Medical Society and the Ramsey County Bar Association in November. St. Paul attorneys Charles Murnane and Richard Kyle were also on the panel. Warren E. Burger, judge of the United States circuit court of appeals, was moderator.

* * *

Dr. Leonard F. Peltier, associate professor and acting head of the division of orthopedic surgery at the Uni-

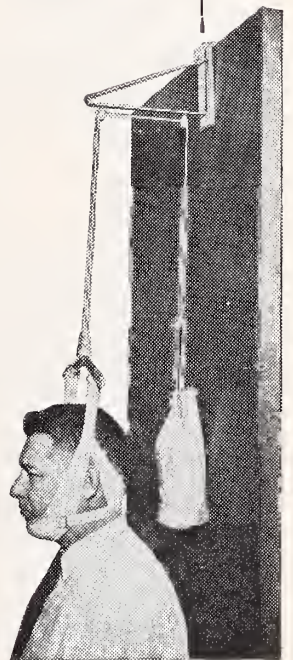
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versity of Minnesota, has been appointed professor of surgery and head of the section of orthopedic surgery at the University of Kansas medical school. Dr. Peltier assumed his new position January 1.

* * *

Dr. Stuart W. Arhelger, Minneapolis, was guest speaker at the third annual cancer symposium of the Montgomery Society for Cancer Control, Dayton, Ohio, in October. His subject was "Advances in the Diagnosis and Operative Management of Gastric Cancer."

* * *

Dr. John R. Earl, St. Paul, has been elected chairman of the Minnesota Council of Churches board of trustees. The first layman elected to this office, Dr. Earl succeeds the late Rt. Rev. Stephen E. Keeler, Episcopal bishop of Minnesota.

* * *

Dr. Morris L. Cable, Minneapolis, was the victim of a robbery early in November. Some \$300 worth of narcotics in a medical bag was stolen from his car.

* * *

Dr. Paul J. Bilka, Minneapolis, spoke at the November meeting of the Red River Valley Medical Society in Thief River Falls, on the diagnosis of various types of arthritis and new methods of treatment. After a joint dinner session with the doctors, the Red River Valley Auxiliary attended a meeting at the home of Dr. and Mrs. M. D. Starekow.

* * *

Dr. James Taggart Priestley was elected chairman of the Board of Governors of the Mayo Clinic at the annual business meeting of the board, Wednesday, December 19. Dr. Priestley, who has been a member of the board since 1947 and vice chairman since 1953, succeeds Dr. Samuel F. Haines, chairman since 1953, who will retire from the Mayo Clinic in 1957. Dr. Priestley is head of the section of surgery in the Mayo Clinic and professor of surgery in the Mayo Foundation Graduate School, University of Minnesota.

Dr. Hugh R. Butt, specialist in internal medicine, was elected vice chairman of the board, and Mr. J. W. Harwick was re-elected secretary. Two new members of the board also assumed office at the annual business meeting—Dr. Howard B. Burchell, a specialist in internal medicine, and Dr. C. A. Good, specialist in roentgenology.

* * *

Dr. R. H. Wilson, Winona, and Dr. R. L. Page, St. Charles, were featured in a special article in the December 22, 1956, edition of the *Winona Daily News*, as presidents of two of Minnesota's leading medical organizations. Dr. Wilson was 1956 president of the Minnesota State Medical Association and Dr. Page is immediate past president of the Minnesota Academy of General Practice; he is now vice president of the State Medical Association.

* * *

Dr. John Schindler, Monroe, Wisconsin, author of the best-seller "How To Live 365 Days a Year," spoke at the University of Minnesota farm campus during the annual "Farm and Home Week" in January. His appearance was sponsored by the Minnesota State Medical Association.

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Book Reviews

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

ORGANIZED HOME MEDICAL CARE IN NEW YORK CITY. A Study of Nineteen Programs by the Hospital Council of Greater New York. 538 pages. Price \$8.00, cloth. Cambridge, Massachusetts: Published for the Commonwealth Fund, by Harvard University Press, 1956.

CLINICAL ROENTGENOLOGY, Volume IV. The Digestive Tract, the Gall Bladder, Liver and Pancreas, the Excretory Tract and Special Studies Emphasizing Differential Considerations. Alfred A. de Lormier, M.D., San Francisco, California; Henry G. Moehring, M.D., Duluth, Minnesota, and John R. Hannan, M.D., Cleveland, Ohio. 676 pages. Illus. Price \$24.50, cloth. Springfield, Illinois: Charles C Thomas, 1956.

THE HAPPY LIFE OF A DOCTOR. Roger I. Lee, M.D. 278 pages. Price \$4.00, cloth binding. Boston: Little, Brown & Co., 1956.

PRINCIPLES OF CLINICAL ELECTROCARDIOGRAPHY. Mervin J. Goldman, M.D., Assistant Chief of the Medical Service and Cardiologist, Oakland Veterans Administration Hospital, Oakland; Assistant Clinical Professor of Medicine, University of California School of Medicine, San Francisco. 310 pages. Illus. Price, \$4.50, paper bound. Los Altos, California: Lange Medical Publications, 1956.

CLINICAL UNIPOLAR ELECTROCARDIOGRAPHY. Third Edition. Bernard S. Lipman, A.B., M.D., F.A.C.P. Instructor in Medicine, Emory University School of Medicine; Consultant Glenville Giddings Cardiac Clinic, St. Joseph Infirmary; Consultant, Cardiac Clinic, Grady Memorial Hospital; Regional Consultant in Cardiology to the Veterans Administration, Atlanta, Georgia; and Edward Massie, A.B., M.D., F.A.C.P., Associate Professor of Clinical Medicine, Washington University School of Medicine; Director of Heart Stations, Barnes Hospital and Jewish Hospital, St. Louis; Director of Cardiovascular Clinic, Washington University Clinic; Area Consultant in Cardiology to the Veterans Administration. 397 pages. Illus. Chicago: Year Book Publishers, Inc., 1956.

THE PATIENT SPEAKS. Harold A. Abramson, M.D. Associate Attending Physician and Chief of Allergy Clinic, Mt. Sinai Hospital, New York; Research Psychiatrist, Biological Laboratory, Cold Spring Harbor; Consultant, Huntington Hospital; Assistant Clinical Professor of Physiology, Columbia University; Consultant (Psychology) Department of the Army. 239 pages. Price \$3.50, cloth. New York: Vantage Press, 1956.

THE MERCK ANNUAL. Ninth Edition. Charles E. Lyght, M.D. Editor, and Editorial Board. 1870 pages. Price, Regular Edition, \$6.75, De Luxe Edition, \$9.00. Rahway, N. J.: Merck & Co., 1956.

ROCKEFELLER FOUNDATION ANNUAL REPORT, 1955. 350 pages. Paper bound. Rockefeller Foundation, New York.

(Continued on Page A-44)

CLINICAL REVIEWS MAYO CLINIC and MAYO FOUNDATION

ROCHESTER, MINNESOTA

April 1, 2, and 3, 1957

Staff members of the Mayo Clinic and the Mayo Foundation for Medical Education and Research will present again this year a three-day program of lectures, discussions and demonstrations on problems of current interest in general medicine and surgery.

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(Continued from Page A-42)

THE TRUTH ABOUT CANCER. By Charles S. Cameron, M.D. 268 pages. Price, \$4.95. Ridgewood, New Jersey: Prentice Hall, 1956.

The author's purpose in writing this book was to inform his readers, the general public, about the fight against cancer and to emphasize each individual's responsibility for his or her own life and health. It is a remarkably lucid portrayal of the purposes and accomplishments of the first decade of the American Cancer Society's activities, during which time the author served as its capable and irrepressible medical and scientific director. An attitude of optimism pervades the narrative, and the style is simple and very readable. As evidence of this, the reviewer's high school daughter picked up the book at home, read it through and proceeded to write a review of it for her English class.

Dr. Cameron is generally recognized by all who have heard him speak and have worked with him as an unusual combination of medical scientist, scholar, and organizational director of exceptional ability. This fall he resigned his position with the American Cancer Society to become the Dean at Hahnemann Medical College.

"The Truth About Cancer" merits a place of prominence in every public and school library. It should be read as widely as possible, by the general public as well as by the medical profession. In his preface to the book, AMA President Elmer Hess concludes with this comment: "I can imagine no book calculated to

yield more important dividends in life and health than this one."

PHILIP F. ECKMAN, M.D.

THE DOCTORS: A GREAT BEHIND-THE-SCENES NOVEL OF THE PARISIAN MEDICAL WORLD. By André Soubiran. Translated from the French by Oliver Coburn. 360 pages. Paper, 50 cents. New York: Popular Library, 1956.

This novel describes "the lives and loves of Parisian medical students." However, it is difficult to learn much of the training of a Parisian doctor.

The novel is involved with the patients on the wards, students on the wards, interns on the wards, and the parties outside of the wards.

The hero is Jean Nerac, a vague figure.

It can be enjoyed as a light novel, but with no serious message of description of Parisian students.

The novel has recently been made into a movie.

C.J.C.

* * *

The knowledge obtained from tuberculin tests is of value to the community and to the health department in comparing the local rate of infection with that in other areas of the country. Uniform testing of school children is valuable to the health department in focalizing the problem in certain sections of the community, in certain racial groups, and in special geographic regions. While it is desirable to test persons of all ages, this presents certain difficulties and the uniform testing of school children with a uniform dosage of tuberculin appears to provide a satisfactory means of comparing tuberculin sensitivity in various areas.—MICHAEL L. FURCOLOW, M.D., *Am. J. Pub. Health*, September, 1956.

Annual Clinical Conference

CHICAGO MEDICAL SOCIETY

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Original Contributions

Psychosomatic Aspects of Heart Disease

RICHARD M. MAGRAW, M.D.
Minneapolis, Minnesota

THE PSYCHOSOMATIC aspects of heart disease are presented from three standpoints. First, they are discussed with regard to that heterogeneous group of symptoms or illnesses ordinarily lumped together under the term cardiac neurosis or "functional" heart disease. These are symptoms of varying degrees of complexity ranging from pain in the chest and shoulder and complaints of shortness of breath to feelings of fatigue and weakness which, for one reason or another, are considered by the patient to be a result of a disorder of his heart and circulatory system, although they are clearly a function of his mental and emotional state. Second, a few of the common emotional reactions of organic heart disease are presented, using as illustrations some of those reactions which, in my judgment, have not received the attention they merit. Third, I shall make some recommendations for managing psychomatic problems associated with the heart, recommendations which are broadly applicable to what has been called the psychological half of medicine.

"Functional" Heart Disease or Cardiac Neurosis

It is important to bear in mind that cardiac neurosis is not a specific diagnostic term and that many different conditions and disorders are lumped together in this category. In clinical usage this term may be applied either when a patient has a strong suspicion or conviction that he has heart disease when he has not (usually called "functional" heart disease), or when he complains excessively or is excessively disabled with a diseased heart. In some of these latter cases the presence of a cardiac lesion, usually, but not necessarily, of minor consequence, appears to focus the patient's awareness on this organ, and complaints about the heart may become the chief vehicle for

the expression of the anxiety, anger, and/or guilt of the patient's life experiences.

In regard to the patient with so called "functional" cardiac symptoms, such a label is not a specific diagnosis, and consequently our understanding of such cases will depend on how far we can go beyond this point to get into the actual mechanisms by which the symptoms come about in a given case. There are many possible mechanisms which may be involved, but, contrary to what the name implies, the symptoms we commonly label "functional" usually are not produced primarily by any physiologic process or change, such as changes in blood pressure or pulse rate.* Rather, these symptoms are usually produced by the psychologic mechanism of symbolism wherein the patient reads into his body a mental picture or image of pathology, as if it were really present. To some degree all symptoms which a patient reports are colored by his mental picture of what is going on within him, so that a measure of individuality referred to as "subjectivity" is introduced in most descriptions of symptoms. However, there are many symptoms in which, for all practical purposes, the whole of the symptom is nothing more or less than an emotionally-charge symbol or mental image projected onto the body, from whence it is reported "as if" it were actually there.

Since this process of symbolization is such an important one in the production of symptoms or

*It is important to clarify the fact that in present day clinical usage the term "functional" disorder has taken on a different meaning than its dictionary definition, i.e., a disorder "affecting function but not the structure." Cardiovascular disorders in which function but not structure is affected, e.g., paroxysmal tachycardia or vasodepressor syncope, are usually diagnosed in terms of the physiologic change apparent, i.e., "paroxysmal tachycardia" or "syncope," whereas the diagnostic label "functional" has, in clinical usage, come to be applied primarily to those symptoms in which no functional change is demonstrated and which are, in my experience in most instances, basically symbolic in nature.

complaints, it follows that it is crucial that the clinician understand the symbolic meaning which any symptom, and particularly which any functional symptom, has to the patient. Unfortunately, this crucial point is almost universally neglected in practice, and we do not get the specific information needed to make a diagnosis since we do not learn what the patient thinks is happening to him when he complains of, for example, chest pains, weakness, palpitation, faintness on exertion, or says that he can't get his breath.

It is wise to emphasize at this point that it is important to distinguish between the question, "What does a patient think is wrong with him?" and the somewhat similar question, "Of what use or comfort is the symptom to the patient?" This latter question has to do with what gains (often secondary) accrue to the patient from his symptom, and it should not distract us from getting an understanding of what the primary, symbolic meaning of the symptom may be to the patient.

Let me give an example of symptoms which suggest heart disease but which are symbolic in origin. One very common symbolic meaning of such complaints as shortness of breath, weakness, and chest pain, symptoms which are suggestive of heart disease, is that they express for the patient feelings such as "I am afraid I have a bad or serious disease," or more specifically, "I'm afraid I deserve to have heart disease" or "I deserve to have something bad happen to me." The patient, in short, is expressing feelings of guilt. In our culture chances are very good that if someone is feeling guilty, he is guilty about angry or destructive thoughts or impulses. Let me illustrate by some case presentations.

Case 1.—A combat pilot in World War II, aged thirty, developed feelings of weakness, pressure over the chest, pain around his heart, and later palpitation, about eighteen months before admission, at a time when he was forced into bankruptcy in a business venture because of the perfidy of a previously admired partner, an older man who had fostered and "fathered" the patient. Following the loss of his business, the patient developed the above symptoms and lost interest in work. At times he fantasied meeting his faithless partner on the street sometime, and in telling me of the fantasy stated "I'd kill him if I saw him." The patient's only remembered experience with heart disease occurred when he was in his teens, when his own father died suddenly of heart trouble. The patient became convinced he had heart trouble and consulted several doctors with the symptoms. An internist became his physician, treated him with Pronestyl, and saw him at regular visits. The

patient showed gradual improvement, picked up his life, and found new work. Unfortunately for all concerned, the internist suffered a fatal heart attack six months later. The patient's symptoms immediately recurred and were more severe than ever. He became extremely anxious and overtly depressed. In even a brief medical contact with this man it was quickly clear that he had very mixed feelings, both those of wanting to be cared for and to receive consideration, and those of intense competitiveness with other persons and fear of being exploited by them. These ambivalent feelings were particularly marked in regard to men older than himself or in positions of authority. It was evident that the patient's angry fantasies toward these father figures had boomeranged via his own guilt, with the production of the conviction that he had heart disease.

Case 2.—Sometimes the same set of symptoms represent another kind of guilt, as in the case of a very attractive young mother, a choir singer, who became sexually involved with the choir director and developed symptoms of weakness, palpitation, pressure in the chest, et cetera. She also had the conviction that she had heart disease. Incidentally, as often happens, in this instance there was a secondary gain for the patient in that her sickness prevented her from doing housework, kept her husband reassuringly in attendance on her, and also helped her in rationalizing her behavior.

In other cases, the meaning of heart disease or heart symptoms is more complicated than simply to symbolize the expectation of punishment growing out of feelings of guilt. For example, the symptoms of weakness, fatigue on exertion, and the conviction of the presence of heart disease may, as in the following case, symbolize the patient's feelings about a basic personal weakness and defenselessness in life and be a way of rationalizing a nonparticipation in life.

Case 3.—A pretty, young married woman for many years had symptoms of weakness and shortness of breath on exertion and the firm but unvoiced conviction that she had a bad heart. She was told during adolescence, after an attack of scarlet fever, that she had a heart murmur. She had had a marked exacerbation of her concern with symptoms of weakness, palpitation, fatigue on exertion, and tiredness after her marriage, and particularly when her husband's job necessitated a move to an alien environment. She had episodes of tachycardia, i.e., panic, which were treated medically, and when first seen over a year ago, her conviction that she had an eminently life-threatening heart condition was so fixed as to amount to a delusion. The patient felt uncomfortable and unsafe when forced to go out of her house, and particularly when forced to remain up after her usual 9:30 bed time. She avoided situations or social contacts which might make these things necessary. After eight months of treatment, she became virtually free of symptoms and is now making a much happier social adjustment.

Another kind of symbolic symptom seen commonly in clinical practice and at times labeled as a cardiac neurosis is that seen in a patient who complains of "pain" in the shoulder, down the arm, and into the hand. The specific type of symbolic symptom I am describing almost always occurs on the left, making it a problem to separate it from angina. (Incidentally, more symbolic or functional symptoms are referred to the left than to the right side of the body.) While the patient often refers to this symptom as pain, when this is pin-pointed it usually turns out not to be pain, but is described as numbness or tingling, and almost invariably in describing it the patient rubs his left biceps with his right hand, clenches his left fist, and cocks his left arm back, flexing his elbow as if to strike. Here the symptom expresses partially inhibited rage. One patient I saw with this syndrome several months ago came back about two months later with a broken jaw which he had sustained in a tavern brawl.

Of course, none of these patients come in with a diagnostic tag on them, and in individual situations it may be very difficult to decide whether a given symptom is symbolic or not. For example, it may be difficult to decide whether a given patient is having angina or the inhibited rage just described, or whether the patient is having attacks of anxiety at night with the sensation of smothering, or is having paroxysmal nocturnal dyspnea. This differentiation is apt to be particularly difficult when there are present physical or laboratory findings which might possibly explain the symptoms, and of course it is not at all unusual to get symbolic symptoms such as dyspnea, palpitation, or pain added to the picture of a patient with organic heart disease. It is important that, as physicians, we always have such a clear picture of the patient's symptoms that they will not be attributed to abnormalities present on physical examination or laboratory tests unless it is likely that these are in fact causing them. The more dramatic the finding, the more likely it is that we will use it as an explanation for symptoms which it does not produce, as in the following case.

Case 4.—A garage mechanic, aged forty-four, complaining of fatigue, inability to withstand the rigors of work, and inability to support his family, was found to be manifestly depressed and more than a little paranoid when examined as an outpatient. Because of a low pulse rate an electrocardiogram was obtained during his medical workup, which revealed a complete heart

block. As the result of concerted medical quizzing and diagnostic procedures, he learned he had heart trouble, and as he became medically sophisticated, his complaint changed to "fainting and fainting spells." In time his psychologic and social status deteriorated. The ultimate medical consensus was that the heart block was a congenital, totally asymptomatic lesion. Nevertheless, because of his basic personality disorder the patient's concept of himself as a cardiac cripple has never wavered, although he has had supportive psychiatric and medical care for years since then.

Less dramatic findings than a complete heart block, such as extrasystoles, systolic murmurs, or borderline electrocardiographic changes more frequently act as diagnostic red herrings. As Alvarez has said, we need a course in medical school on disregarding positive findings that can't explain syndromes¹

It is important to emphasize that as far as the patient is concerned it is not knowledge of findings of this type which in itself makes a patient pathologically anxious. Rather his anxiety comes from other sources, and any changes in function or insignificant somatic findings present may serve as convenient and socially acceptable hooks on which to hang his feelings. Thus, for example, all of us have had transitory, almost subliminal pains or sensations in the chest. When these occur on the right side of the chest we usually ignore them. When they occur on the left side of the chest, we ordinarily give them only a passing thought. However, if at the time this left-sided pain occurs we are anxious about some other problem in our life we may well displace this anxiety and thus become concerned about this chest pain and the likelihood of heart disease. One of the characteristics of anxiety is that in its naked, or "free floating" state, it is so uncomfortable that we deflect or modify it quickly, often by displacing it from its original source.

In clinical practice it is usually not too hard to be reasonably sure why the anxiety was displaced to a particular region or organ. Sometimes the choice of symptom results from such factors as some recent or dramatic illness of a relative, friend, or public figure, President Eisenhower's coronary occlusion being a case in point. Or it may result from a remembered illness in the patient's life or in the lives of the parents or siblings, or from the sensations caused by the patient's own body processes, especially if these have been modified or amplified by emotions.

Sometimes, too, the doctor may unknowingly di-

rect the patient's emotional reaction toward one organ or another. Insofar as the problem of cardiac neurosis is concerned, this is particularly apt to occur when the patient comes in in a panic or an acute anxiety state, and the doctor cannot help but be impressed by the pounding heart and rapid pulse and may be unwilling to state categorically that there is nothing wrong with the heart. I remember doing this when I was in rural practice and a young man came running into the office in panic just at the supper hour, complaining, "Something's wrong with me." His bounding pulse and forceful apex beat with associated extracardiac sounds made me a little uncertain, and I must have communicated this to him in examining the heart, for by the next day the patient's anxiety was no longer free floating, but had channeled into a near conviction that he had a serious heart disease. We doctors should not blame ourselves too much when this happens, since free, unmodified anxiety is so uncomfortable for a patient that some alteration in it is going to result in any event.

Regardless of the individual variation in the pathway of symptom formation, the essential point is that we need to know all we can as to what the symptom means and why a particular one is "selected." In any diagnostic process it is necessary that some direct connection be established between the suspected pathologic condition and the things the patient complains of before the diagnosis is considered certain. This of course is just as true in regard to psychosomatic diagnoses as it is in regard to other diagnoses, since a diagnosis which rests simply on the fact that there are present both symptoms not otherwise explained and significant emotional conflicts or problems of living, without any direct association being established between them, is a very shaky diagnosis indeed. It can be compared to the practice of assuming that a nondescript abdominal pain is caused by the gallstones which are demonstrated incidental to an x-ray survey of the gastrointestinal tract. This brings us to the second area of consideration, namely a discussion of a few of the emotional reactions resulting when people learn they have heart disease.

Psychologic Reactions to Organic Heart Disease

Grief is the one completely appropriate and virtually essential emotional reaction in a patient who learns he or she has organic heart disease (or for

that matter any other disabling disease). Grief is a healing process and may be regarded as a homeostatic mechanism, since it has as its result the restoration of emotional equilibrium after we have been bereft. It is psychologic healing of the experience of loss or separation and represents the "scabbing over" of a wound and the recognition and acceptance of the loss. Whether the loss be that of a friend, an idea, a part of the body, a part of life, or of health, the process is essentially the same. We have to hold the loss up and look at it, and in doing so recognize the implications of the loss. For example, in the case of heart disease this may mean recognizing the loss of an avocation, say hunting or hiking, or loss of youth or possibly of work. When we do this we feel sorrow and the healing flow of tears. Thus we draw back to ourselves for reinvestment in another part of life or another person a large part of the emotional investment we had in the thing we have lost.

One reason for emphasizing the normalcy and utility of grief is that until a patient has the healing experience of grief or "works through" his feelings about his heart disease, he has not reached his maximum recovery. To be sure, patients who have suffered a loss, such as the loss of vocation because of a myocardial infarct, sometimes put off the painful working through of grief by repressing or distorting the emotion or the experience. In doing this by one device or another, they wall off an important part of themselves from any real participation in living until, at a later date, a delayed grief reaction is precipitated. However, until the grief is worked through, there remains a tender area of psychologic inflammation, sometimes hidden, a "collection of emotional pus,"³ potentially capable of spreading or disabling the patient by psychologic symptoms or illness.

Moreover, it is important to distinguish between the healing release of grief and the resentful reaction of "grieving" which is a kind of nursing one's misfortune to keep it alive, and in which there is no real acceptance of loss but primarily the angry reiteration of the feeling, "Why did this have to happen to me?"

Because it is usually the healthiest of emotional reactions to organic illness, and because it is self-healing, grief is somewhat set apart from other emotional reactions to heart disease. What reactions other than grief a patient may have to heart disease will depend on many factors, such as the

circumstances under which the disease develops, the time in the patient's life, the kind of person the patient is, and his habitual patterns of handling his problems, among others. We have all seen a variety of such reactions, but in the time available I will be able to discuss only one or two to illustrate the distinctions between this group of psychologic reactions of illness and the functional symptoms described above. For example, heart disease must take its place along with diabetes, cancer, et cetera, as one of the conditions which is likely to "trigger" a depression of middle life. These conditions all tend to remind us of our own perishability, or at least that our life is passing, and thus to activate those potentials of unhappiness which are the inevitable residue of whatever neurotic compromises and adjustments we have made with the realities of life.² One neurotic adjustment to life commonly seen is that of living in a somewhat contractual way wherein the proposition is that good behavior, i.e. virtue, will ultimately be rewarded. This widespread idea often is the keystone of a self-sacrificial life, though it runs contrary to biblical injunction that "virtue is its own reward." If this contract were written, it might read something as follows: "I'll live by these rules such as self-sacrifice, conscientiousness, loyalty, et cetera, and in return I will be rewarded by such things as approbation, status in the community, and possibly even protection from the vicissitudes of life, such as ill health." Although this may be the way we are trained as children, in adult life other persons with whom we associate, as well as the events of our life and our times, are not actually a party to this contract. Consequently, while we may uphold our part of this bargain, our environment is not likely to. Ultimately we feel cheated and resentful. A diagnosis of heart disease is apt to set off such a reaction, as it may bring home to a patient that this contract of his is not going to be fulfilled, and leave him with the feeling of having somehow been robbed. Of course, this feeling is not apt to be expressed directly; rather, the patient clinically appears depressed.

Another reaction to the diagnosis of heart disease sometimes seen is the anger and defensive belligerence of the person who has built his personality around such compensatory defenses as bravado and an assumed invincibility. This kind of person often feels that he is alone and that the world about him is a kind of jungle. Such a

person is a "paper tiger," who uses bravado to ward off inner feelings of his own vulnerability and loneliness, and who, when cardiac invalidism or disability threatens to puncture his defenses, cannot help but react with anger to the threat.

Surgical treatment of heart disease is becoming more common; therefore, I would like to comment on some of the emotional implications of surgery in heart disease. We would assume that a procedure would prolong life and make it more active and comfortable would be welcomed without reservation, and would not cause emotional difficulty. In most cases that is true, but in others the improved physical status may bring problems and produce psychologic stress. Consider the following patient, one I have seen recently.

Case 5.—A married woman, aged thirty-eight, mother of three children, with a long history of severe and worsening episodes of cardiac decompensation caused by rheumatic valvular heart disease, had had a successful and life-saving mitral commissurotomy eight months previously. Rheumatic valvular disease had developed while the patient was in her teens, but it was not until she had been married several years and had had recurrent bouts of rheumatic fever that this in any way affected her life. She had led an active life until forced into increasing invalidism by symptoms for the five or six years prior to surgery. The patient had an unexpressed conviction that the inexorable progression of her symptoms and disability had resulted from the demands on her of her marriage, and particularly of her motherhood. Despite a good functional result after surgery the patient had not enjoyed her improved health, but rather had overemphasized her residual cardiac disability. In fact, there was reason to believe that she had precipitated an episode of decompensation by eating large quantities of salted popcorn, although she had carefully observed a restricted salt intake for years previously.

Here, then, is another type of psychosomatic problem in heart disease. This patient, having capitalized on her invalidism or reconciled herself to it by getting certain emotional gratifications out of it, in this instance prestige in the community and a tyrannical position within the family because of her martyrdom, found it difficult to relinquish this role for the more active participation in life offered her by new surgical techniques. This was true despite the fact that before the operation she had ostensibly been anxious to have it.

A Recommendation for Managing Psychosomatic Problems

Successful management of psychosomatic problems is based on many medical skills and attitudes

including the doctor's knowledge about people and the problems of living as well as his capacity to relate to other people and to use himself in such relationships as an instrument of treatment. However, it is also based on the doctor's ability to make a specific diagnosis regarding the symptom, or to come to an incisive understanding of the patient's complaint. Because this need for specific diagnosis of symptoms is frequently overlooked, and because the problems which arise in caring for patients with psychosomatic disorders are often traceable to just this point, I wish to discuss diagnostic specificity as an aid in the management of psychosomatic disorders.

Making a specific diagnosis of the cause of symptoms (after the manner described earlier in this paper) is largely a matter of skillful history taking or medical interviewing, and ordinarily can be readily accomplished. However, in clinical practice, as was noted earlier, more often than not a specific diagnosis as to the nature of a functional symptom is not made. Consequently, from the outset the stage is set for inconclusive therapy and frustration for doctor and patient.

This disregard for diagnostic accuracy is by no means confined only to functional symptoms. Rather, it reflects a fundamental fault in our medical habits of diagnostic thinking and is not something that crops up only in relation to psychosomatic symptoms, although it may be more obvious there. The fault I refer to has to do with doctors' failure in many instances to get an adequate understanding of patients' symptoms because of perfunctory history taking. The result is that they must rely primarily on findings to make a diagnosis or else rely on the self-limited character of the disease itself and thus avoid the necessity for making a diagnosis on which to base treatment.

In theory, a diagnosis is made by the following process: first, by means of a medical history or interview, we get a clear understanding of the patient's symptoms, their development, and then get what information we can from the physical examination and indicated laboratory procedures. Practically, all too frequently we get from the patient by history only a very general idea of what his trouble might be. Then we pass on to the physical examination in the hope of discovering an answer and then throw out a kind of diagnostic

dragnet of laboratory and x-ray procedures in the expectation that something may turn up. Having failed to exploit the potential for accurate diagnosis available in getting a history, we are all too often left with only the relatively meager and sometimes misleading data obtained from physical, laboratory, and x-ray findings to go on. The result is often a diagnostic impasse.

The reasons for the prevalence in medicine of this unrewarding type of diagnosis are too complex to be discussed here and will be presented in a later paper. Suffice it to say that in addition to the problems of communication involved, there is also the fact that the need for specific symptom diagnosis is generally unrecognized. Consequently, we are likely to accept a patient's complaints at face value, making little attempt to have him spontaneously define or amplify them further. Often at this point the doctor makes an interpretation or guess as to what a patient means by what he says. Instead, the patient should be encouraged to explain and not be permitted to evade sharp definition of his symptoms. Many times patients say something like "It's just a sort of a pain. *You know,*" and the doctor finds himself nodding in agreement and passing on to another question when, in fact, he doesn't know at all. What is required is a nondirective type of history taking which follows the patient's train of thought, but what often takes place is a directed type of question and answer interview which necessarily follows the questioner's associations.

To disregard partially our best source of information,⁴ namely the things the patient can tell us about his own symptoms, is, to say the least, inefficient. More efficient management of psychosomatic problems must rest on specific diagnosis of symptoms, which in turn must rest on adequate communication with the patient.

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The Diagnostic Importance of Uterine Artery Size

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ALTHOUGH cases of uterine artery hypertrophy have been reported from time to time, usually in conjunction with vascular anomalies, vascular tumors,¹ or neoplasms of the uterus,² the diagnostic value of fluctuation in the caliber of these vessels has not been fully exploited by clinicians. Particularly, little attention has been given to their behavior during pregnancy, yet here is where assessment of their size can be of daily clinical usefulness.

In 1952, while interpreting a large series of iliac artery angiograms, Borell and Fernstrom³ became interested in the marked variation in uterine artery size. In this and subsequent studies⁴⁻⁷ they made many important observations on the response of the uterine vasculature to the ovarian hormones and to normal intrauterine pregnancy, tubal ectopic pregnancy, hydatidiform mole, and choriocarcinoma. To determine the extent to which uterine artery size is governed by ovarian hormones, they selected a group of amenorrheic women in whom hormone excretion tests and cytologic studies revealed an absence of endogenous estrogen. Iliac artery angiograms were then made before, during, and after ovarian hormone replacement therapy. In summarizing their results, these authors state that "as the uterine arteries were the only blood vessels showing an alteration in width, they are apparently particularly sensitive to hormone action, irrespective of whether the stimulus is direct or indirect." After studying the angiograms in cases of early pregnancy, they found that uterine artery hypertrophy became clearly established in the second month. They also observed that in tubal ectopic pregnancies, the adnexal branch of the homolateral uterine artery was as large as the ascending portion of the uterine artery from which it was derived, whereas in normal intrauterine gestation, the adnexal branches remained unchanged, being of much smaller size than the parent vessel.

Finally, angiographic studies were made of hydatidiform moles and choriocarcinoma. In addition to a striking increase in the caliber of the uterine arteries, a characteristic mottling was noted to occur within the uterine wall itself, apparently the result of unusually large arteriovenous shunts which exist in this type of conceptional abnormality.

As a result of the foregoing studies, and others involving pelvic angiography in a variety of gynecologic disorders, Borell and Fernstrom³ suggest that greater diagnostic accuracy awaits the clinician who utilizes this method of visualizing the uterine circulation. Of what they are seemingly unaware is that the uterine arteries are easily accessible to the palpating finger, and fluctuations in their caliber can be detected accurately and without expense or danger to the patient by careful pelvic examination. During the past four years it has been the author's practice to palpate for the uterine arteries routinely in the course of bimanual examination, and the observations made form the basis of this report.

The ascending branches of the uterine arteries are located at two and ten o'clock in relation to the circumference of the cervix and two to four centimeters above the level of the external os. They are most readily palpated during rectovaginal examination, when the cardinal ligament is compressed between the two examining fingers much as it is grasped by a hemostat during vaginal hysterectomy. Especially is this true if the uterus is retrodisplaced. Ordinarily, in the absence of pregnancy or pelvic pathology, the uterine arteries are either not palpable at all, or only faintly so. However, under the influence of any factor which increases the metabolic activity of the uterine tissues, these vessels quickly enlarge to a degree commensurate with the increased metabolic demand. The most common such factor is conception. There is probably no tissue in the human body more metabolically active than the uterus as it is being invaded by embryonal trophoblast,

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and the demand imposed upon its vascular channels of supply is both immediate and imperative. Hence, it is not surprising that by the end of the fourth week of conceptional age, that is when the menses is approximately two weeks overdue, the uterine arteries usually become distinctly palpable, and not infrequently exhibit a bounding pulsation as clearly defined as the radial pulse. This arterial hypertrophy precedes the appearance of Hegar's sign, Chadwick's sign, and softening of the uterus, for these are the later manifestations of passive venous congestion.

A very interesting observation is the behavior of the uterine vessels in the presence of tubal ectopic pregnancy. The uterine artery on the homolateral side is found to be of distinctly larger caliber than the contralateral vessel. Again this is not surprising, for tubal ectopic pregnancy in the human is physiologically analogous to unilateral pregnancy in one horn of the uterus duplex in lower mammals. As Reynolds⁸ has shown in rabbits, the gravid uterine horn hypertrophies much more quickly and extensively than does the nongravid horn, and the very foundation of this uterine growth is the preceding vascular hypertrophy. The adnexal or anastomosing branch of the ascending portion of the uterine artery leading to the developing ectopic conceptus is its principal arterial supply, and usually this branch can be felt as a strongly pulsating vessel immediately subjacent to the tender tubal mass. This asymmetric hypertrophy of the uterine vasculature can be a valuable diagnostic aid in the evaluation of unruptured tubal ectopics. However, it is in no sense pathognomonic, for other causes of localized increase in tissue metabolic rate, e.g., infection or rapidly growing neoplasm, can induce similar regional arterial hypertrophy. Therefore, interpretation of this sign should always follow careful correlation with the other clinical and laboratory findings. When this is done, the degree of diagnostic accuracy can be considerably enhanced, as illustrated by the following case report.

Case Report

The patient (Mrs. A. M. P., Hospital No. 321-899) was a twenty-four-year-old gravida 11, para 1, whose only previous pregnancy followed an uneventful course to a normal spontaneous delivery in 1947. A six-year interval of involuntary sterility followed, during which time the menstrual periods were normal.

On May 13, 1953, she was admitted to the University

of Illinois Research and Educational Hospital with the complaint of having had some intermittent cramping suprapubic pain two months previously and again four days prior to admission. There had been no menstrual aberration through the time of her last normal period, which occurred twenty days prior to admission. However, with the recurrence of the suprapubic cramps four days before admission, she had noticed some spotting. She came to the hospital not because of distress, but out of curiosity about the spotting.

Examination revealed a well developed and nourished Negro female of stated age who was alert, comfortable, and co-operative. The significant findings were slight tenderness on deep palpation in the right lower quadrant without rebound tenderness or rigidity, and a slightly tender right adnexal mass. This mass was fusiform, about five centimeters in length, and not freely movable. The uterus was estimated to be 120 gram size. It was firm, symmetrical, and motion of the cervix caused no distress. The right uterine artery was palpable but the pulsation was of only moderate intensity. The ascending branch could be traced upward to the ventral aspect of the right adnexal mass, with no appreciable alteration in its width as it was followed distally. The left uterine artery was not palpable, and the left adnexa were normal. The cervix was healthy in appearance, and there was a minimal amount of old blood in the posterior fornix. The culdesac was vacant and there was no regional hyperthermia anywhere in the pelvis.

Laboratory findings were as follows: Hemoglobin 13 gm., hematocrit 44, RBC 4.12 million, WBC 9,000. A catheterized urine specimen contained no albumin, sugar, or bile, but gave a positive urobilinogen reaction up to 1:20 dilution. Microscopically, it was negative. Cultures of the urethra and cervix were subsequently reported negative for *Neisseria gonorrhea*. The clinical impression at the time of admission was unruptured right tubal ectopic gestation with *in situ* death of the conceptus. The patient was kept on the ward under observation for the next twelve days, during which time she was frequently re-examined. By the end of this interval, all abdominal tenderness had disappeared, the right uterine artery had slowly regressed to the point where it could no longer be palpated, and the right tubal mass exhibited only negligible discomfort on compression. Its size remained essentially unchanged however.

Because ampullary tubal abortion could not be ruled out, laparotomy was undertaken on May 22, 1953. On entering the pelvic cavity, approximately fifty cubic centimeters of old blood was found in the culdesac. The omentum and rectum were adherent to a right tubal mass which was four by five by six centimeters. The corpus was about one and a half times normal size, and direct palpation of the uterine arteries and the ovarian arteries revealed no hypertrophy on either side. Right salpingectomy was performed, the tube hardened in Keyserling's solution for four days, and then the specimen was sectioned with a sharp microtome blade. A five millimeter embryo was found completely surrounded by an old blood clot which filled the amniotic cavity. Outside the amnion, an organizing hematoma was found to have infiltrated all layers of the tubal wall. On micro-

scopic examination, degenerating chorionic villi and sheets of syncytium were found throughout the muscularis. The pathologic diagnosis was: Ectopic pregnancy, missed abortion type.

A case such as this is representative of an untold number of ectopics each year which escape detection, but with no serious consequences. Had this patient not been subjected to surgery, the ectopic pregnancy would undoubtedly have undergone progressive hyalinization to become merely fibrous thickening in the right tube, such as are not infrequently encountered as incidental findings during the routine examination of gynecologic specimens in the surgical pathology laboratory. It is tempting to speculate that had she been given antibiotics during the period of observation, the progressive decrease in tenderness might have been erroneously construed as confirmation of an inflammatory mass responding to therapy. The key to the correct diagnosis in this instance was the behavior of the uterine vessels in relation to the other clinical findings.

After encountering the above case, subsequent cases of ectopic pregnancy were examined periodically during the postoperative course. It was found that the arterial hypertrophy usually had disappeared by the end of seven to ten days. This observation suggested the possibility that regression in uterine artery size might be of value in diagnosing missed abortion, and clinical observation bore this out, but only in cases where the patient had been examined prior to the occurrence of intrauterine death, so that comparison of the arteries before and after could be made. In such circumstances, arterial regression usually precedes noticeable diminution in uterine size. This can be particularly helpful in evaluating cases in which obesity of the patient or retrodisplacement of the uterus make accurate appraisal of its size difficult. The diagnosis of missed abortion should never be founded upon subjective signs alone, and though decrease in uterine artery size may early suggest the possibility of intrauterine death, more objective criteria must be awaited before intervention is undertaken.

Though the author has not had the opportunity to confirm it, regression in uterine artery size should theoretically have clinical usefulness in the follow-up evaluation after removing a hydatidiform mole, because prior to evacuation, the arterial hypertrophy has been shown to be maximal. Failure of arterial regression to occur after emptying the uterus, or partial regression and then re-expansion would be cause for concern regardless of hormone titers.

In summary, it should be re-emphasized that the uterine arteries respond dramatically to any rapid increase in metabolic demand within the tissues which they supply. Both the speed and the degree of their expansion are unique, partly because of the singularly dynamic growth patterns of the uterus compared with other organs of similar size, and partly because of their intrinsic and specific sensitivity to the ovarian hormones. With practice, the changes in the uterine vasculature can be easily and accurately followed by rectovaginal palpation, and when correlated with the other clinical and laboratory findings will prove to be a rewarding diagnostic aid in solving many of the common problems in the practice of obstetrics and gynecology.

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Review of Coroner's Cases in Olmsted County, Minnesota (1924-1953)

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THE OFFICE of coroner is our legacy from the English system of jurisprudence. It was created in medieval times, and the name derives from *custos placitorum coronae*, or "keeper of the pleas of the crown" within a county. According to some authorities, it originated under King Athelstan in the tenth century; other authorities date it from the articles of the eyre, or *capitula itineris*, in the thirteenth century. Even at that time, certain qualifications, such as knighthood and property ownership, were required for office. Today in England the coroner usually is a barrister, and the coroner's physician is a pathologist, and these are appointive positions.

The Current Scene

Although we adopted the office of coroner, we failed to stipulate the necessary qualifications, and in more than two thirds of the states this position is an elective office. The only statutory requirement is that the candidate be a registered voter, and the only practical requirement is that he possess the ability to obtain enough votes for election. Aside from the several states or parts thereof that have adopted the medical examiner's system, in 1931 only three required that the coroner be a physician.¹ As a result, the coroner in most instances has had no specific training, either medical or legal.* It is questionable, therefore, whether such a person has the judgment to determine if further medical investigation of a death is warranted, except in the most obvious of circumstances.

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The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.

*In Minnesota, no coroner may practice as an attorney in any court (Section 387.13).

To the general public, the importance of an elective office bears direct relationship to its position on the ballot. Since the office of coroner usually appears toward the end of the ballot the occupant thereof is considered relatively unimportant. However, his duties and powers are quite broad. Specifically, they vary from state to state, but generally the primary duty of the coroner is to determine the circumstances surrounding violent deaths and those from natural causes, with no previous medical history. The coroner has the authority to order necropsy, bacteriologic and chemical analyses and inquests. In some states he must obtain court permission for a necropsy. To the public he is best known for his work in criminal cases; however, such cases actually comprise only a small segment of his duties. The investigation of violent deaths other than homicides and suicides has become increasingly more important as legal medicine has assumed greater proportions in this country. This category would include traffic fatalities, industrial accidents and the many other types of accidental death. In all phases of medicine the ultimate aim is prevention rather than treatment; therefore, it is the coroner who is in the position to study these cases and to help formulate preventive measures.

Coroner's System in Olmsted County

Olmsted County, Minnesota, has had a satisfactory coroner's system for a number of years. The office of coroner has been held by a physician for seventy years (with the exception of an eighteen-month period), and the coroner's pathologist has been the pathologists of the Mayo Clinic for fifty years. Although this arrangement is unique for a county of 50,000 population, most counties of this size have physicians who could occupy the coroner's office and at least one pathologist who could act as coroner's physician.

Nature of Present Study

Since Olmsted County has had a progressive system for a number of years, it was felt that a study of the coroner's work would prove worth

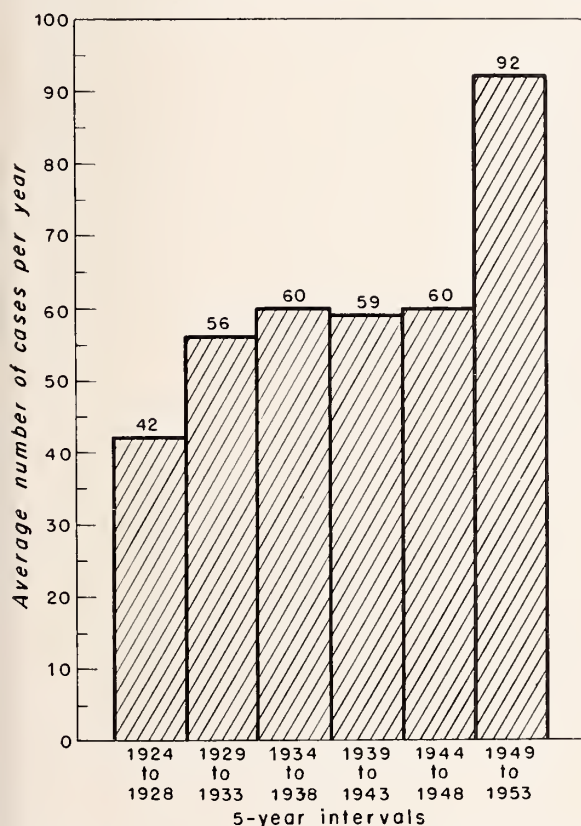


Fig. 1. Coroner's cases, Olmsted County, 1924 through 1953. Average number per year in five-year intervals.

while. This investigation was undertaken with twofold purpose: to demonstrate the quality of work which is possible, and to determine whether any conclusions could be reached on the basis of such a study. For example: What are the types of injuries sustained in traffic accidents? Is there any correlation between the seating position in an automobile and the injuries received in an accident? At what age is suicide most prevalent? What are the common causes of accidental poisonings? These and other questions perhaps can be answered by such an investigation.

Work Load

During the thirty-year period of this study, 1924 to 1953, inclusive, a total of 1,800 cases were investigated by the coroner, an over-all average of sixty per year. The number of cases per year varied from a low of thirty-one in 1926 to a high of 103 in 1951. Yearly variations were

fairly marked; therefore, it was necessary to divide the thirty-year span into five-year intervals for better representation. Figure 1 shows the average number of cases per year for the five-year periods.

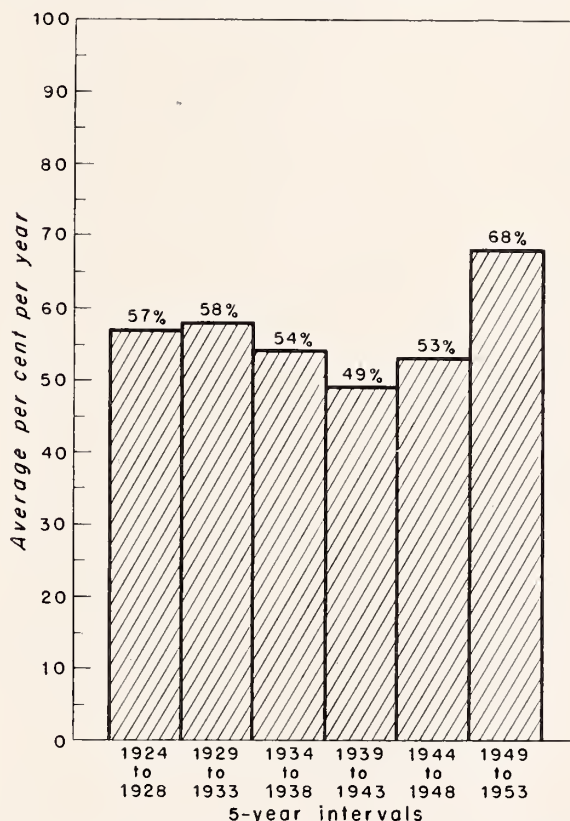


Fig. 2. Coroner's cases, Olmsted County, 1924 through 1953. Percentage of cases in which necropsy was done. Average per cent per year in five-year intervals.

From 1924 to 1928, inclusive, there was an average of forty-two cases per year, and then for the next twenty years the average yearly rate was rather constant, varying from fifty-six to sixty per year. In the postwar period of 1949 to 1953, the yearly average increased to ninety-two. When the census variables, both resident and transient, are taken into consideration, it is found that the rate of coroner's cases is approximately constant for the first twenty-five-year period of this study, meaning from 1924 to 1948, inclusive. However, in the last five-year period, the rate increased. We feel that this greater incidence is due in large part to increased interest and realization of the importance of investigating deaths from unknown causes or trauma.

Postmortem Examinations

Figure 2 is a graphic representation of the percentage of coroner's cases in which postmortem

examinations were performed. This figure likewise demonstrates a slight increase during the last five years. The average percentage for the thirty years is fifty-nine, and the deviation is

in which necropsy was done slightly exceeded the number in which necropsy was not done, but in the last five-year period the ratio was 3:1. Figure 4 shows similar curves calculated for necropsy

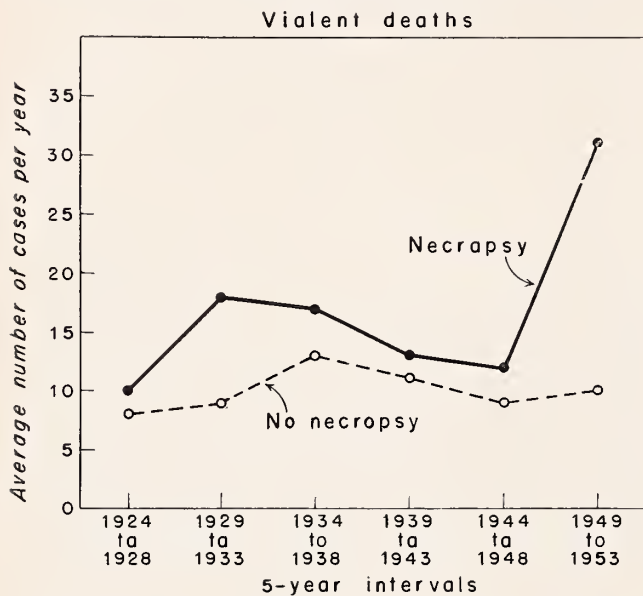


Fig. 3. (Left) Coroner's cases, Olmsted County, 1924 through 1953. Deaths due to violence. Average number of cases per year in 5-year intervals.

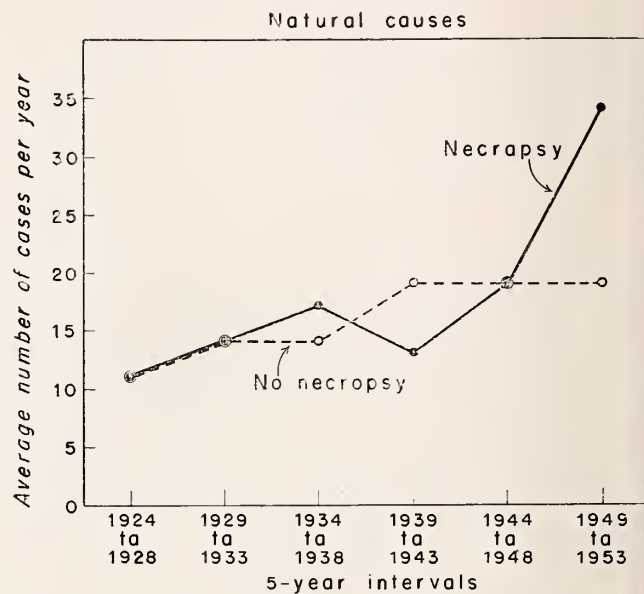


Fig. 4. (Right) Coroner's cases, Olmsted County, 1924 through 1953. Deaths due to natural causes. Average number of cases per year in 5-year intervals.

TABLE I. VIOLENT DEATHS

	Necropsy	No Necropsy
Accidental	350	146
Traffic	183	42
Falls	37	9
Poisons	31	4
Burns	17	13
Asphyxia	17	8
Gunshot	13	11
Falling objects	12	4
Drowning	11	43
Crushing	9	5
Explosions	9	0
Electrocutions	5	1
Miscellaneous	6	6
Suicides	134	132
Homicides	19	2
Total	503	280

just as much below this average as it is above it. This compares very favorably with the necropsy percentage sixty-two in Los Angeles County, California, which is generally considered to have an excellent coroner's system.² The greatest increase in total investigations in the coroner's office occurred during the tenure of the present coroner.

These cases were divided into two large groups: persons who died of natural causes and persons who died from violence of any type. Figure 3 indicates the deaths due to violence, showing the number of cases in which necropsy was performed and those in which it was not done. During the first twenty-five years the number of cases

in deaths due to natural causes. During the first twenty-five years the number of cases in which necropsy was done was approximately equal to the number in which it was not done, and in the last five years there was an increase in the number of postmortem examinations, but the increase was not nearly so marked as that in the category of deaths due to violent causes (Fig. 3). This clearly demonstrates the increasing importance attached to the investigation of deaths due to violence.

Deaths Caused by Violence

First, we should like to consider those cases of death from violent causes. In this category there were 503 cases in which postmortem examination was performed. These were distributed as shown in Table I. Seven-tenths of the deaths were caused by accidents, meaning that no criminal intent was involved, either to oneself or to someone else.

Automobile Accidents.—More than half of the accidental deaths were due to traffic accidents. The incidence of traffic fatalities varied from 3.4 per cent for the period 1924 to 1928, inclusive to 11 per cent per year for the period 1949 to

1953, inclusive. The relative rate by five-year periods from 1924 to 1948 was constant when the population change is taken into account. However, there was a marked increase for the five-year period 1949 to 1953, and this we feel cannot be accounted for on the basis of increased accident rate alone, but rather, on the enlarging concept that such fatalities should be investigated by the coroner. Hence, more such accidents are coming under the coroner's jurisdiction. There were seventy automobile-pedestrian accidents. The most common injuries suffered by the pedestrian were fractures of the skull, extremities and ribs, lacerations and contusions of the brain, and hemorrhage into the lungs. Collisions of automobile with automobile numbered seventy-two. The most common injuries resulting from this type of accident were fractures of the ribs, skull and extremities, contusions of the brain, lacerations of the great vessels, liver and spleen, and hemorrhage into the lungs. There were thirty-four fatalities resulting from single-automobile accidents. The most common injuries under these circumstances were fractures of the ribs, extremities and skull, and laceration and hemorrhages into the brain.

Table II is a summary of all the injuries encountered in these three groups. It will be noted that in all three of these types of traffic accidents, the ribs, extremities and skull are the predominant bones fractured. Injuries to the brain are of about the same frequency in all three. However, injuries to the cardiovascular system are more common in collisions between automobiles. This undoubtedly is due to the sudden deceleration in head-on collisions. A surprising finding was the incidence of injuries to the adrenal glands: 13 per cent of 176 cases. It is impossible to ascertain how many instances of adrenal insufficiency were occasioned by adrenal damage and the stress of injury, but it can be speculated that supportive therapy may have saved some of the persons concerned. When one adrenal body is injured, it is possible that the other one cannot compensate rapidly enough, in view of the stress of other severe injuries.

Injuries to drivers and passengers were studied in the category of collisions of automobile with automobile. There were seventy-two cases of this type (Table II). The fatalities in this group were divided evenly between driver and passenger. Both drivers and passengers received essentially

the same types of injuries, with the exception of skull fracture. Passengers received twice as many fractures of the skull as did drivers. Undoubtedly, the basis for this difference is the fact that the

TABLE II.
INJURIES RECEIVED IN TRAFFIC ACCIDENTS

	Automobile vs. Automobile	Single Automobile Accidents	Pedestrians in Automobile Accidents
Total cases	72	34	70
Fractures			
Skull	30	11	38
Spinal column	10	2	6
Extremities	44	15	33
Pelvis	11	3	12
Ribs	44	15	32
Central nervous system			
Lacerations, brain	9	8	14
Contusions, brain	26	12	27
Cord trauma	3	0	2
Cardiovascular system			
Lacerations, heart	9	1	5
Lacerations, aorta	14	2	4
Lacerations, major veins	1	1	1
Gastrointestinal system			
Lacerations, liver	22	5	12
Lacerations, spleen	17	4	8
Genitourinary system			
Lacerations, bladder	1	3	2
Lacerations, kidney	5	5	2
Respiratory system			
Lacerations, lungs	7	4	13
Hemorrhagic, lungs	28	12	22
Endocrine system			
Lacerations, adrenals	9	3	6
Lacerations, pancreas	1	1	0

steering wheel protects the driver from being thrown against the windshield. This is one of the reasons why safety authorities advocate the use of safety belts.

Deaths resulting from traffic accidents in which the occupant was forcibly thrown from the vehicle also were tabulated. In collisions between automobile and automobile, 10 per cent of the seventy-two deaths, and in the single-automobile accidents 53 per cent of the thirty-four deaths, occurred in this manner. In the second group, fourteen persons were killed by crushing as the vehicle rolled. In one case the driver was thrown 143 feet ahead of the automobile, which continued to roll until it crushed the victim. Why a driver or passenger should be thrown from the car five times as frequently in a single-automobile accident as in a collision between automobile and automobile is difficult to answer. Perhaps, in the case involving the single automobile, it is the element of surprise, or perhaps there is greater tendency for the car to roll than when two automobiles collide. In discussing some of the more recent accidents with the investigating officers, it was interesting to discover that persons who were not hurled from the automobile usually were not

killed or even seriously injured. This is certainly a telling argument for the development of better safety latches on automobile doors and also for the use of safety belts.

p.m. probably is related to heavier "rush-hour" traffic, both pedestrian and automobile, and to the increased number of school children playing at this hour. The peak reached at 8:00 p.m. cer-

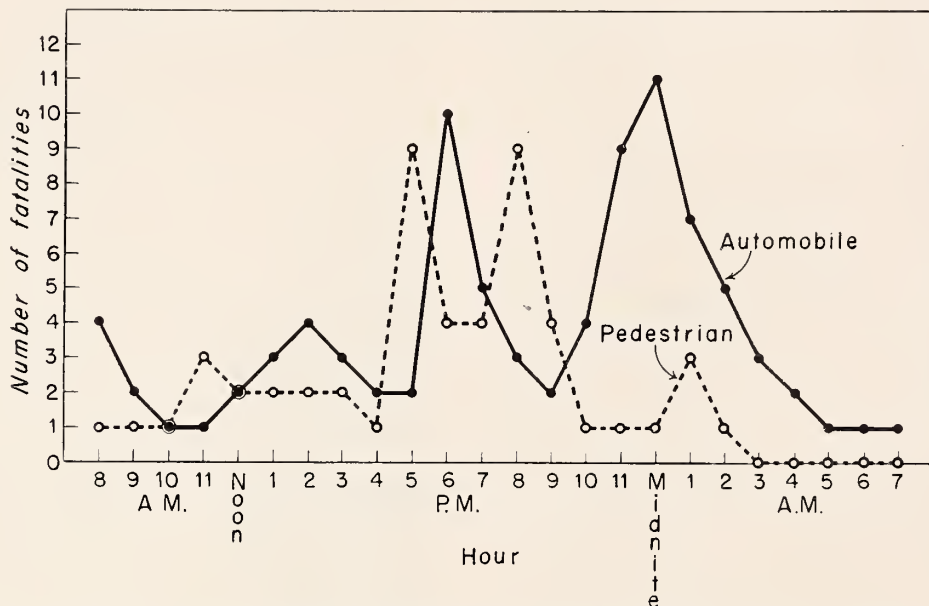


Fig. 5. Coroner's cases, Olmsted County, 1924 through 1953. Pedestrian fatalities and persons killed in automobile traffic accidents, according to hour of occurrence.

Of the seventy pedestrians killed in traffic accidents, twenty-seven were children under the age of ten years. Three times as many pedestrians were killed in the first decade of life as in any other. In contrast to these findings, it is noted that the peak of fatalities among victims of automobile accidents occurs in the second and third decades. The incidence in those two decades is more than double that of any other age group. Only two children less than the age of ten years were killed in automobile accidents.

The hour at which fatal traffic accidents occurred was known in eighty-eight automobile accidents and fifty-four accidents involving automobiles and pedestrians (Fig. 5). There are two marked peaks in the curve calculated for fatalities resulting from automobile accidents, one at 6:00 p.m. and another at midnight (Fig. 5). The peak reached at 6:00 p.m. probably is related to heavier traffic and fatigue at the time when people are returning home from work. The peak reached at midnight undoubtedly is influenced by such factors as fatigue, speed, alcohol and others. The curve calculated for pedestrian fatalities also shows two significant peaks, one at 5:00 p.m. and a second at 8:00 p.m. The peak reached at 5:00

tainly is due to decreased visibility because of darkness.

We might summarize the facts that have been learned from this study of traffic fatalities: (1) more traffic fatalities are being investigated by the coroner's office; (2) fractures of the skull, ribs and extremities, and lacerations or contusions of the brain were the common injuries in all types of traffic fatalities; (3) cardiovascular injuries seem to be more common in accidents involving sudden deceleration (collisions); (4) adrenal injury often occurs, and may be one of the underlying causes of shock; (5) in fatal automobile accidents, passengers received skull fractures more often than did drivers; (6) the inefficiency of automobile door latches under the stress of impact is a common cause of occupants' being thrown out and fatally injured; (7) fatalities in automobile accidents occur more commonly during the evening "rush hours" and at midnight; and (8) pedestrian fatalities also occur more commonly during the evening "rush hours" and shortly after dark.

Deaths from Falls.—There were thirty-seven cases of accidental death caused by falls, and the

height of these falls varied from ground level to thirty feet. More than 50 per cent of the victims died from fractures of the skull and lacerations of the brain. Eleven persons died from compression or laceration of the spinal cord as a result of either fracture or dislocation in the cervical part of the spinal column, or both. All these victims struck the ground on the head, back of the neck or feet. Two deaths were caused by rupture of the aorta, and in one case the rupture was so small that the victim lived for one hour. In one instance, a fall resulted in rupture of the base of the mesentery, and death was caused by retroperitoneal hemorrhage, no other lesions being found. Two interesting cases in which falls were involved might well have been listed as cases of accidental death (with all insurance implications), had not postmortem examination been performed. In one of these, an elderly man was seen to fall on an icy sidewalk, and was pronounced dead on arrival at the hospital. Examination revealed that massive pulmonary embolism actually was the cause of death. In the other case, the victim fell down a flight of steps and was pronounced dead immediately. Coronary occlusion was found at necropsy.

Accidental Poisoning.—Accidental poisoning as a cause of death occurred in thirty-one cases. One third of these deaths were due to carbon monoxide poisoning; all the victims were men except one. The source of the carbon monoxide was either automobile exhaust or heating units. There were nine cases of acute alcohol intoxication, both methanol and ethanol, and all the victims were men. Postmortem examination in these cases revealed either edema of the brain or edema of the lungs. Four children died from the accidental ingestion of poisons. Three of these poisons were arsenical compounds (insecticides) and one was a phosphorus-containing compound (rodent exterminator).

Deaths from Asphyxia.—Seventeen fatal accidents were classified as having been caused by asphyxia. Most of these deaths were brought about by aspiration of a food bolus or a foreign body. Several infants were thought to have smothered in bed clothing. Further investigation probably would have proved an underlying etiologic basis other than asphyxia.

Miscellaneous Deaths.—The remainder of the accidental deaths were distributed as is shown in Table I, which is self explanatory. The number of cases in each category was too small to permit any generalizations.

Suicides.—There were 266 suicides during this thirty-year period. For the first twenty-five years, the percentage of cases in which necropsy was done was fairly constant, averaging slightly less than fifty, during the last five-year period the average yearly percentage of cases of suicide in which necropsy was done increased to seventy-five. Our study shows that twice as many males as females committed suicide. The ages ranged from sixteen to ninety-one years, with 50 per cent of the victims being in the age group of forty to sixty years.

1. Firearms.—Men committed suicide with firearms three times as often as did women. Four of five times a small-bore pistol or rifle was used, and the most common site of injury was the head, with fracture of the skull and lacerations of the cerebral hemispheres and brain stem. Shotguns generally were used to inflict wounds of the abdomen and thorax, and in all our cases there was mutilating damage to the heart.

2. Sharp Instruments.—Men also used sharp instruments (razors and knives) three times as often as did women. Except in one instance, all the injuries were lacerations of the throat. Death usually was caused by severance of the jugular veins, and in one case the wound was sufficiently deep to lacerate the aorta.

3. Poisons.—Women committed suicide by ingestion of poisons twice as often as did men. The most commonly used poison was one of the barbiturates, and nearly all deaths due to these drugs have occurred since 1940. There were fifteen cases of lysol poisoning and eight cases of arsenic poisoning, all of which were recorded prior to 1940. Other agents used were strychnine, halides, chloroform and carbon monoxide.

4. Leaping to Death.—Women jumped to their death twice as often as did men. Most of these, of course, died instantly; however, several lived for a few minutes to an hour, even though they had fallen from a height as great as five stories. Besides multiple fractures of bones, lacerations of the brain, liver, spleen, heart, aorta or great

TABLE III.
DISTRIBUTION OF CAUSES OF NATURAL DEATH

Cause	Necropsy		No Necropsy	
	No.	%	No.	%
Unknown	17	3	77	17
Cardiovascular system	321	59	260	56
Nervous system	61	11	65	14
Respiratory system	87	16	15	3
Gastrointestinal system	30	5	16	3
Genitourinary system	7	1	6	1
Miscellaneous	25	5	31	6
Total	548	100	469	100

arteries and veins were found in all cases, and often all these injuries were found in the same case.

5. Hanging.—Ligature was used equally by both men and women. In all but one instance, the method was hanging. Actually, the most outstanding feature of postmortem examination in these cases was the lack of pathologic lesions. Usually, only congestion of the viscera was seen and occasionally fracture of the cornu of the hyoid bone.

6. Miscellaneous.—Among the miscellaneous forms of suicide were drowning, burning and asphyxiation. Since suicide constitutes a felony*, examination should be done in every case. In all probability death by homicide, accident and natural causes has been interpreted as "suicide," and such mistakes could have been avoided in some instances if necropsy had been performed.

Homicides.—There were twenty-one homicides, less than one per year, and postmortem examination was performed in nineteen of the cases. In cases in which examination was not done, the homicides were committed prior to 1935 (one an infanticide; the other a homicide during robbery). There is no valid reason why necropsy should not be performed in every homicide and every instance of suspected homicide.

Deaths from Natural Causes

There were 1,017 deaths due to natural causes, and postmortem examination was performed in 548 of these cases. In Table III the causes of

*Minnesota statutes (Section 610.01) define a felony as "every crime which may be punished by death, or by imprisonment in the state prison or state reformatory." In Section 619.01 suicide is defined as "the intentional taking of one's own life." It is difficult to perceive, then, how successful suicide could be punished according to statutes on the basis of commission of felony, but that is a matter for the practitioners of jurisprudence to resolve.

death as entered on the death certificates are given according to organ systems.

Cardiovascular Disease.—It is noted that diseases of the cardiovascular system were the most common diagnoses made; they comprised almost the same percentage in both cases in which necropsy was done and cases in which it was not done. However, there were differences in the specific diagnoses of diseases in these two groups. For example, acute myocardial infarction was found at necropsy in 20 per cent of the deaths due to cardiovascular disease, whereas it was not diagnosed once in cases in which necropsy was not done. When postmortem examination had been done, no vague diagnosis as a cause of death was given, but when necropsy had not been done, such nebulous causes of death as "heart trouble" and angina were listed.

Central Nervous System.—The percentage of deaths attributed to lesions of the central nervous system in the cases in which necropsy was not performed also was comparable to the percentage in which necropsy was done. Cerebral vascular accident was a diagnosis much favored in cases in which necropsy was not done; it comprised 50 per cent of this group. The exact meaning of this diagnosis cannot be interpreted and, as any physician knows from past experience, it can cover a number of different pathologic processes. This diagnosis, of course, never was listed in postmortem protocols. By way of contrast, in cases in which necropsy was done 50 per cent of the deaths were found to be due to rupture of a congenital aneurysm of the circle of Willis, but this diagnosis was never made in the cases in which necropsy was not done. As mentioned above, in respect to cardiovascular causes of death, vague diagnoses also were quite common in this group when necropsy was not done. Such causes were listed as "brain trouble," "senile atrophy of the brain" and "psychiatric disorders."

Respiratory Diseases.—Five times as many deaths were attributed to diseases of the respiratory system in those cases in which necropsy was done as in those in which it was not done. It is more difficult to make a clinical diagnosis of death due to a respiratory lesion when the victim has not been under the immediate care of a physician, and this probably accounts for the marked difference. In the eighty-seven cases in which

necropsy was performed, twenty-seven persons died from pulmonary embolism, but this diagnosis was made only twice in cases in which there was no necropsy. Pneumonia accounted for approximately a third of the deaths and the remainder were due to edema of the larynx or trachea. In those cases in which necropsy was not done, more than half of the diagnoses were "pneumonia." As will be noted in Table III, "unknown cause of death" as a diagnosis was listed six times as frequently in those cases in which necropsy was not performed as in those cases in which it was done. This, we felt, was one of the most significant findings in this portion of the study.

Sudden Death.—The last analysis made was that of sudden death due to natural causes. Of the 548 cases of nonviolent death in which necropsy was done 392 (71 per cent) were classified as cases of "sudden death" (Table IV). Of the 392 persons concerned, 295 were men and ninety-seven were women. Generally, the incidences of diseases of the different organ systems were the same for males and females. Of the 392 sudden deaths 307 (80 per cent) were due to cardiovascular disease; that is, four of every five deaths. This is a higher percentage than has been reported by Janes³ (60 per cent), in England, and Helpert and Rabson⁴ (50 per cent), in Manhattan. Coronary arteriosclerosis was the most common cause of sudden death from diseases of the cardiovascular system, comprising about a half. The ratio of males to females was 4:1, slightly higher than the over-all ratio of 3:1 for all sudden cardiovascular deaths of this type. We found that this ratio of 4:1 was substantially constant for all age groups. Some authors have reported that coronary arteriosclerosis occurs earlier in males than in females, but our investigation did not bear this out. However, coronary arterial occlusion and myocardial infarction did occur earlier in the male. For example, among the males, there were eleven instances of myocardial infarction in the age group thirty to forty-nine years, and fourteen instances of coronary arterial occlusion in the age group forty to fifty-nine years, but neither of these diseases was found in the female in these same age groups. Also, myocardial infarction occurred five times as frequently and coronary arterial occlusion twelve times as frequently in men as in women. The incidence of dissecting aneurysms of the aorta, acute dilata-

TABLE IV. SUDDEN DEATH DUE TO NATURAL CAUSES

Cause	Sex		Total
	M	F	
Cardiovascular			
Coronary arteriosclerosis	114	29	143
Myocardial infarction	49	11	60
Coronary occlusion	25	2	27
Aortic stenosis	15	4	19
Dissecting aortic aneurysm	8	8	16
Dilatation, heart	11	8	19
Hypertension	8	5	13
Congenital anomalies	2	3	5
Miscellaneous	3	2	5
Total	235	72	307
Central nervous system			
Rupture cerebral aneurysm	8	6	14
Infractions	7	1	8
Miscellaneous	3	2	5
Total	18	9	27
Respiratory system			
Pulmonary embolism	14	7	21
Obstruction airway	8	0	8
Miscellaneous	3	5	8
Total	25	12	37
Miscellaneous	17	4	21

tion of the heart and hypertension was higher in the female than in the male. In this category, we also found three instances of occlusion of the coronary ostia from syphilitic aortitis and one case of blockage of the mitral valve by a ball thrombus.

Twice as many males as females died suddenly from lesions of the central nervous system. Approximately 50 per cent of these deaths were due to rupture of a cerebral aneurysm, and all of the victims were above the age of thirty years, the majority being in the sixty to sixty-nine-year age group. Of the deaths from diseases of the respiratory system, approximately two-thirds were caused by pulmonary embolism. All the victims were above the age of forty years, and were predominantly from sixty to seventy-nine years old. We found eight cases in which death was due to asphyxiation from obstruction of the air passages. These included inflammatory edema and hemorrhage from the site of a tracheotomy.

The cases of death in this group are a challenge to the coroner's pathologist, in that there is often no preceding medical history to guide him in making the diagnosis. Although a valid diagnosis cannot be made on the basis of statistics in any one specific case, a knowledge of the percentages of frequency of different categories of death is helpful.

Summary

1. A detailed review of the investigations of the coroner's office of Olmsted County from 1924 to 1953, inclusive, is presented.

2. With increasing interest in accidental and violent death and with improvement in cooperation among law enforcement officers, coroner, coroner's physicians and the state crime laboratory, more investigations have been carried out in the last five years of this study.

3. In automobile accidents, the passenger is more vulnerable to trauma to the head than is the driver, and the person who is thrown from the car is more likely to be killed than is the person not hurled from the car.

4. Trauma to the adrenal gland was seen in 13 per cent of 176 cases. The adrenal insufficiency secondary to this may result in persistent shock and, if this is true, supportive therapy will be of value.

5. Deaths caused by accidents involving automobiles and pedestrians occur in peaks at 5:00 p.m. and 8:00 p.m., whereas deaths caused by collisions of automobile with automobile occur at 6:00 p.m. and midnight.

6. Collisions of automobile with automobile resulted in trauma to the cardiovascular system more commonly than did other types of traffic fatalities.

7. Coroner's investigations of falls are of extreme importance in determining, if possible, a reason for the fall.

8. Prior to 1940 lysol and arsenic were the poisons most frequently used in suicides, but since 1940 barbiturates are the most commonly used agents.

9. There is no valid reason why necropsy should not be performed in every homicide and in every instance of suspected homicide.

10. Among the 1,017 deaths due to natural causes, postmortem examination was performed in 548. In 569 cases in which postmortem examination was not performed, the use of the term "unknown cause of death" was six times as frequent as in cases in which necropsy was done.

11. On the basis of the statistics summarized herein, other details may be adumbrated.

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SURGERY TO LOOM LARGER IN PEDIATRICS

"Surgical progress in pediatrics has outstripped that of pediatrics itself in many ways, and surgery looms ever larger in pediatric practice as medical problems diminish; and diagnosis in many important surgical problems depends largely on radiological findings," Dr. John Caffey, noted New York City specialist in pediatric x-ray, has reported.

Dr. Caffey, who is associated with Babies Hospital in New York, has written a sixty-year review of pediatric x-ray in the United States. The report is part of a series commemorating the fiftieth anniversary of publishing by the *American Journal of Roentgenology, Radium Therapy and Nuclear Medicine*, in which Dr. Caffey's comments were published (September, 1956).

"It is a fact that effective pediatric surgery is untenable without accurate radiology, and pediatric radiology deserves to be a specialty more for its surgical than its medical value," the New York specialist says.

In his study of sixty years in radiology's history, Dr. Caffey traced the twin growths of pediatrics and radiology and how these two medical specialties have now fused into a sub-specialty: pediatric radiology.

"After the first burst of enthusiasm following Roentgen's discovery of x-rays, American pediatric radiology

failed to progress and actually suffered a decline, in relation to the growth of general radiology and general pediatrics, which lasted well into the 1940's," Dr. Caffey continues.

During this slow growth, the use of x-rays was extended from careful studies of skeletal maturation to present-day examinations which make possible the intricate, life-saving surgical procedures.

Dr. Caffey gives credit to the Boston Children's Hospital for the first and most important impetus given to pediatric radiology, and he quotes in his report from two physicians associated with that hospital in 1907. Their words were prophetic concerning radiology's role in medicine today.

The two pioneers, Drs. Thomas Morgan Rotch and Ariel George, said:

"As one of the primary aids to diagnosis, and also often determining the treatment for both medical and surgical cases, the Roentgen method is rapidly taking its place with all others, but in many cases proving expert physical examinations to be wrong. To diagnose and to treat without this proof (the x-ray) of correctness has in many cases proved fool-hardy, dangerous and without excuse. The Roentgen method assists, corrects and controls otherwise faulty diagnosis."

Male Hypogonadism

The Eunuchoidal Syndromes

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THE PROBLEMS associated with the study of male hypogonadism are many and to a considerable degree are rendered more difficult by the lack of entirely suitable definitions and classifications. Testicular deficiency may result in various disorders having widely different clinical and pathologic characteristics. Since the testes have a dual role, the hypogonadal diseases may reflect variable disturbances of reproductive or endocrine function. The testicular androgenic hormone is a potent anabolic substance and has among other actions a conspicuous effect upon skeletal development. Although this hormone is a growth-promoting agent, it induces epiphyseal fusion and thus causes cessation of linear growth. Androgen insufficiency during the pubertal period results in a delay in epiphyseal closure and the growth of long bones continues beyond the normal. This alteration of skeletal development results in eunuchoid proportions. Failure of testicular androgenic secretion occurring after puberty will, of course, have no effect on the established normal skeletal proportions. Thus, very prominent clinical differences will occur in the hypogonadal disorders with onset before puberty as compared with those disorders occurring initially in adulthood. With the principal exception of hypogonadism secondary to panhypopituitarism, all hypogonadal disorders with onset during or before puberty will be characterized by so-called eunuchoidal features.¹ The term eunuchoid or eunuchoidism refers to an individual who, although possessing gonadal tissue, has many characteristics similar to an individual castrated before puberty. Castration after puberty results in a eunuch but not in eunuchoidal characteristics.

The classic eunuchoidal characteristics include a high pitched voice, absence of facial hair, sparse pubic and axillary hair, infantile genitalia, small

prostate and seminal vesicles, absence of ejaculation, poor development of paranasal sinuses, poor muscular development, wrinkling of the facial skin, and a distinct alteration of the normal skeletal proportions. The eunuchoidal type of skeletal development refers to an abnormal length of the long bones. This can be evaluated clinically by a comparison of the lower body measurement (distance from sole to symphysis pubis) with the upper body measurement (distance from symphysis pubis to vertex). At birth the normal male infant has a U/L ratio of 1.69.¹ This ratio approaches 1.00 at about ten and one-half years of age and is approximately 0.98 in the normal adult male. In eunuchoidism the U/L ratio is less than 0.95. Expressed somewhat differently, the lower body measurement of a eunuchoid individual exceeds the upper body measurement by more than one inch. This disproportionate growth of the extremities can also be evaluated by comparison of the total arm span with body height. In eunuchoidal skeletal growth, the span exceeds the height by two or more inches.

Since the characteristics of eunuchoidism are usually apparent and can be evaluated by simple clinical observations and measurements, the male hypogonadal syndromes characterized by these features should be easily recognized. It is the purpose of this paper to attempt differentiation and clarification of those hypogonadal disorders in which eunuchoidism is present.

Before discussing the eunuchoidal syndromes, it would be well to briefly review the normal histology of the testis and the important pituitary-gonadal relationships. The structure of the normal testes varies considerably with the phases of normal maturation. There are six principal, although somewhat arbitrary, stages of testicular development and regression; namely, the fetal testis, the postnatal testis, the childhood testis, the pubertal testis, the adult testis and the senile testis.² Figure 1 illustrates the histologic features of the normal

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adult testis. Descriptions of the normal architecture of the testis during the entire life span of the male have been presented by Albert and associates.²

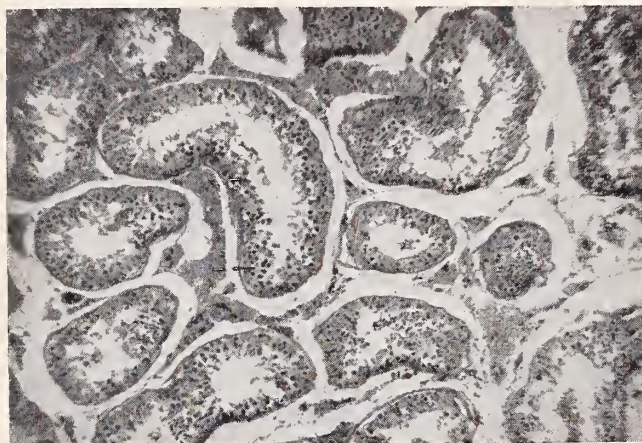


Fig. 1. Photomicrograph of a normal adult testis. The seminiferous tubules are fairly uniform and are actively producing sperm. The Sertoli cells form the basal layer and the entire tubule is surrounded by the tunica propria. The Leydig cells form small clusters or islands in the interstitial spaces.

Maturation and differentiation of the testis depends to a large degree on the pituitary gonadotropins; namely, the follicle stimulating hormone (FSH) and the interstitial cell stimulating hormone (ICSH). ICSH is comparable to the luteinizing hormone (LH) of the female. Current evidence would seem to support the concept that FSH exerts its major effect upon the seminiferous tubules and ICSH causes maturation of the Leydig cells. Mature Leydig cells secrete testosterone (or some closely related androgenic hormone) which in turn tends to inhibit the secretion of the pituitary gonadotropins.

Hypogonadal disorders may result from a deficiency of the gonadotropins or as a result of primary testicular abnormalities or malformations. Theoretically, at least, determinations of FSH secretion (as reflected by urinary excretion) might be expected to offer a means of separating these two major groups of hypogonadal disorders. Present methods for determination of the urinary FSH excretion employ bio-assay techniques and have many limitations. The test is generally inaccessible, extremely costly, and of variable accuracy. A study of the histology of the testis in the hypogonadal syndromes by employing the relatively simple method of testicular biopsy offers a valuable procedure for accurate differentiation.

Deficiency of the Pituitary Gonadotropins (FSH and ICSH)

A lesion which produces total destruction of the anterior pituitary gland results in deficiency of all hormones including ACTH, somatotropin, and gonadotropins. The onset of this disorder before puberty results in dwarfism due to the more prominent effect of absent growth hormone. However, a specific and selective deficiency of the pituitary gonadotropins occurring before puberty results in a form of hypogonadism with prominent eunuchoidal features. This syndrome has been described as "Hypogonadotropic Eunuchoidism"³ and "Idiopathic Eunuchoidism with Low FSH,"⁴ Albert and associates⁵ estimate that 20 to 25 per cent of all cases of eunuchoidism are associated with this type of hypogonadism. In this syndrome, gynecomastia does not occur, pubic and axillary hair is present but sparse, and the testes are present but uniformly small. There is an absolute aspermia. Determination of the urinary excretion of 17-ketosteroids is of no particular value in the differentiation of the various eunuchoidal syndromes; however, in this disorder the excretion tends to be decreased. The urinary excretion of FSH should invariably be absent or extremely low in this form of hypogonadism. The testicular biopsy is of specific diagnostic value. The histologic structure is essentially that of a normal prepubertal testis.² Mature Leydig cells are absent and the tubules show variable degrees of maturation from lumenless cords to early tubular differentiation without spermatogenesis. The histology reveals immaturity, not atrophy (Figs. 2 and 3).

Isolated Deficiency of ICSH

Pasqualini,^{6,7} McCullagh and associates,⁸ and Landau⁹ have described cases of hypogonadism presumably due to a specific deficiency of the pituitary ICSH with normal FSH. In most instances, the deficiency apparently developed before puberty and thus eunuchoidism was a prominent clinical manifestation. Landau,⁹ however, reported an instance of this syndrome in an adult male with normal skeletal development. The syndrome has been termed "Hypoandrogenic syndrome with normal spermatogenesis"⁷ and "Eunuchoidism with spermatogenesis."⁸ The individuals have been referred to as "fertile eunuchs." Since the testicular mass depends primarily upon the presence of nor-

mal tubules, the testes in this syndrome are of normal size. Gynecomastia is apparently uncommon in this syndrome. The remaining features are common to those in other types of eunuchoidism. The

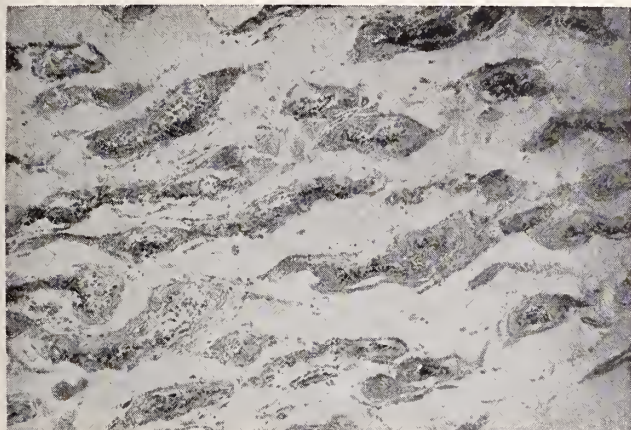


Fig. 2. Photomicrograph of testicular biopsy from case of hypogonadotropic eunuchoidism. Absent Leydig cells. Immature tubules without spermatogenesis. (R.A.: Age twenty-five. U/L ratio = 33/37. 17-KS, 3.8, 5.3, 2.8 mgs./24 hrs. FSH less than 6 mouse units.)

verified only by breast biopsy. Examination of the scrotum may falsely suggest bilateral cryptorchidism, since identifiable testicular mass may be essentially absent. The urinary 17-ketosteroid excre-

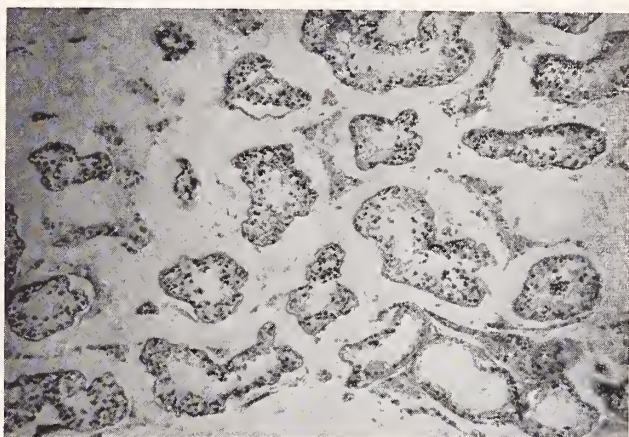


Fig. 3. Photomicrograph of testicular biopsy from case of hypogonadotropic eunuchoidism. Almost complete absence of Leydig cells. Immature tubules without spermatogenesis. Loose areolar interstitium.

(H.B.: Age twenty-one. U/L ratio = 36/38. 17-KS 14.1 and 15.9 mgs./24 hours. FSH less than 12 mouse units.)

ejaculate is essentially normal and the seminal fluid contains active normal spermatozoa. The urinary 17-ketosteroid excretion tends to be decreased, but the urinary FSH excretion is normal. Attempts at measuring the urinary ICSH by the rat prostatic phosphatase test and attempts at estimating androgen excretion by determination of the semen fructose concentration have been described, but the measurements are of questionable validity. Testicular biopsy reveals diagnostic changes in the histologic structure. There is either complete absence or marked hypoplasia of the Leydig cells. The seminiferous tubules are generally normal and active spermatogenesis is present.

Primary Failure of All Testicular Development

A primary deficiency of all testicular function may result from congenital failure of gonadal development. This abnormality, referred to as testicular agenesis, anorchia, or hyporchia, results in very severe forms of eunuchoidism. The clinical syndrome has been termed "Prepuberal non-castrated eunuchs"³ and "Functional prepuberal castrates."¹⁰ Some of the distinguishing clinical features include gynecomastia, small genitalia with marked decrease in the scrotal contents and essentially absent body hair. The gynecomastia is usually readily apparent but occasionally can be

tion is very low and the urinary FSH excretion is characteristically elevated. Biopsy of the scrotal contents reveals absence of both Leydig cells and functioning tubular structures. Derivatives of the Wolffian duct structures may be present.

Primary Failure of the Seminiferous Tubules

In 1942 Klinefelter, Reifenstein and Albright¹¹ described nine cases of hypogonadism characterized by gynecomastia, aspermatogenesis, increased FSH but without an absence of Leydig cells. Variants of this syndrome have subsequently proved to be the most common form of hypogonadism. The disorder has been described by others as "Klinefelter's Syndrome," "Puberal seminiferous tubule failure"³ and "Sclerosing tubular degeneration."⁴ The original description stressed the presence of gynecomastia; however, Heller and Nelson^{3,12,13} described cases without gynecomastia having the other characteristic manifestations and histologic features. These authors also suggested an inverse relationship between the degree of gynecomastia and the degree of eunuchoidism. Howard and associates⁴ agree that cases without gynecomastia differ in no significant way from those with gynecomastia but do not agree with any constant relationship of this sign with the other classic features of eunuchoidism. It

seems generally agreed that in this syndrome there may be varying degrees of gynecomastia and eunuchoidism. Normal skeletal development or minimal eunuchoidal proportions are common while extreme degrees of eunuchoidal skeletal proportions are less frequently encountered in this hyogonadal disorder. The scrotum and penis may be normally developed but the testes are almost always small. The ejaculate may be fairly adequate but the seminal fluid is characterized by azoospermia. The 17-ketosteroid excretion, while occasionally reduced, is most often within normal limits. The urinary FSH excretion is characteristically increased. The testicular biopsy is once again diagnostic. The characteristic histologic picture reveals varying degrees of tubular hyalinization. This is often severe with complete sclerosis of the tubule and a markedly thickened tunica propria. The Leydig cells occupy the bulk of the specimen and usually form large "adenoma-like" masses. This prominence of the interstitial cells is almost certainly due to an absolute cellular increase and not simply clumping secondary to

acteristics always indicates onset of the hormonal insufficiency prior to or during puberty. A few clinical variations may aid in the differential diagnosis. The determination of urinary 17-ketosteroid

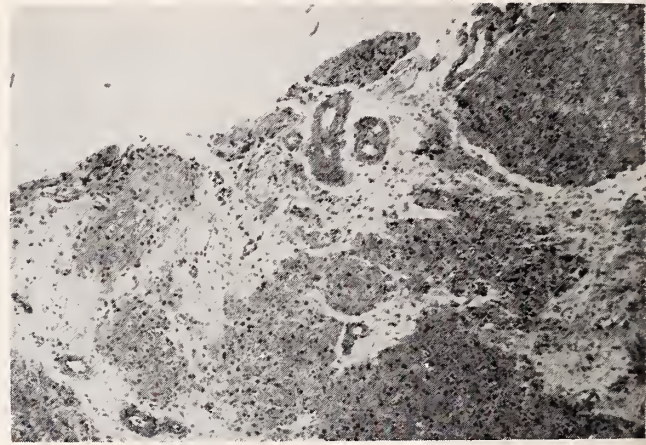


Fig. 4. Photomicrograph of testicular biopsy from case of puberal seminiferous tubule failure. Markedly thickened tunica propria with partially hyalinized tubules. Bulk of specimen consists of large clumps of "normal appearing" Leydig cells.

(S.G.: Age thirty-two. 17-KS, 9.2 mgs./day. FSH greater than 96 but less than 196 mouse units. Normal skeletal proportions.)

TABLE I. DIFFERENTIATION OF THE EUNUCHOIDAL SYNDROMES

	Hypogonadotropic Eunuchoidism	Fertile Eunuchs	Hyporchia	Puberal Seminiferous Tubule Failure
Gynecomastia	Absent	Uncommon	Present	Variable
Testicular size	Small	Normal	Extremely small	Small
Eunuchoidal proportions	Prominent	Usually prominent	Very marked	Variable
17-Ketosteroids	Decreased	Decreased	Decreased	Decreased or normal
Urinary F.S.H.	Absent	Normal	Elevated	Elevated
Histology	Absent Leydig cells. Immature tubules. No spermatogenesis	Absent Leydig cells. Normal tubules with active spermatogenesis	Absent Leydig cells and tubules. Wolffian duct structures	Hyalinized tubules with clumps of Leydig cells

shrinkage of the tubules. Figure 4 shows the typical histologic features of this syndrome.

A highly interesting but still perplexing aspect of this syndrome has been the discovery of a "female type" of chromosomal pattern¹⁴ in the nuclei of some cells examined in patients with this hypogonadal disorder.^{15,16} However, study of the polymorphonuclear leukocytes in this syndrome has revealed a "male type" of chromosomal nuclear pattern.¹⁷

Summary

Eunuchoidism may be the outstanding clinical feature in four of the hypogonadal disorders; namely, (a) Hypogonadotropic eunuchoidism; (b) eunuchoidism with spermatogenesis; (c) primary hyporchia, and (d) puberal seminiferous tubule failure. The presence of eunuchoidal char-

acteristics of very limited value in separating these syndromes. The many limitations relative to urinary bio-assay for FSH greatly reduces the clinical application of this procedure. The use of testicular biopsy for study of the histologic features offers a relatively simple and rather clear-cut means for accurate diagnosis of the eunuchoidal syndromes (Table I).

Acknowledgment

The author wishes to thank E. B. Flink, M.D., Chief of the Department of Medicine, Veterans Administration Hospital, Minneapolis, for permission to review some of the case material from his files.

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(Continued on Page 101)

Bonadoxin for Nausea and Vomiting of Pregnancy

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NAUSEA and vomiting are frequent companions of women early in pregnancy and of the surgical patient in the early postoperative period. The severity may vary from an occasional episode of mild nausea to emesis of everything consumed, solid or liquid. It may vary from day to day and from one pregnancy to another even in the same individual.

Many theories have been advanced to explain these symptoms and little agreement has been reached except that most authorities believe that they are, in part, psychosomatic. Histamine has long been blamed as one of the etiologic factors and some success in therapy has been achieved with antihistaminic drugs. Pyridoxine (Vitamin B6) has also produced some relief, as have many other drugs too numerous to mention. Consequently, it was felt that a combination of a potent antihistaminic drug (Meclizine 25 mg.)¹ and Pyridoxine (50 mg.) might prove to be an effective addition to the armamentarium of therapy.²⁻⁴ Such a combination is now available under the trade name of Bonadoxin.⁵

It is the purpose of this study to detail our experiences with the use of this drug in the treatment of nausea and vomiting. Most of the study has been in the first trimester of pregnancy, but a small additional group has been observed during the early postoperative period.

Materials and Methods

Pregnancy.—For this study, consecutive patients were taken. No attempt at selection was made with the exception that all patients were less than twelve weeks' pregnant. The composition of each group, study and control, is shown in Table I.

All of the patients were white, except for two colored multigravida in the study group and three

colored multigravida in the control group. This incidence was so low that no attempt was made to study its effect on the final results nor to separate final results into racial differences.

TABLE I. GROUP COMPOSITION

	Study Group	Control Group
Primigravida	242	237
Multigravida	378	383
Para 1	182	193
2	122	117
3	47	44
4	18	21
5	6	4
6	0	1
7	0	1
8	1	0
9	1	1
10	1	0
Total	620	620

The age distribution in both groups was essentially similar both in primigravida and in multigravida and no statistically significant age factor could be found.

Both groups were placed on a low fat, high protein diet of approximately 1500 to 1600 calories. Frequent, small feedings were encouraged (every two to three hours) rather than the usual three-meal-a-day routine of the non-pregnant woman. Adequate amounts of vitamins and minerals to satisfy minimum daily requirements were included from natural sources.

In the early weeks of this study, the control group was given no medication, but it was soon apparent that this was not a proper control since 92 per cent of these women continued to have the same or increased amounts of nausea and vomiting. None of this group were included in the study. Thereafter, all of the control group were given a colored placebo tablet composed of beta lactose. These tablets were made approximately the same size as the tablets used in the study group and were administered in the same manner (one tablet at bedtime). The results of the use of this placebo in the control group are shown in Table II.

From the Departments of Obstetrics and Gynecology, St. Joseph's Hospital, St. Paul and University of Minnesota Medical School, Minneapolis.

We are indebted to the J. B. Roerig Company for generous supplies of Bonadoxin for some of the clinical trials in these studies.

NAUSEA AND VOMITING OF PREGNANCY—GOLDSMITH

TABLE II. RESULTS WITH USE OF PLACEBO IN CONTROL GROUP

Group	Number	No Change	Slight Improvement	Moderate to Complete Improvement
Primigravida	237	53 22.4%	75 31.6%	109 46.0%
Multigravida	383	103 26.9%	97 25.3%	183 47.8%

For the purposes of this report, only complete cessation of both nausea and vomiting or elimination of vomiting and most of the nausea are considered as satisfactory results and are grouped under moderate to complete improvement. Anything less has been classified as slight improvement or no change.

In the study group, an empiric dosage of Bonadonin of one tablet at bedtime was established. The results in this group are shown in Table III.

TABLE III. RESULTS WITH USE OF BONADOXIN IN STUDY GROUP

Group	Number	No Change	Slight Improvement	Moderate to Complete Improvement
Primigravida	242	3 1.2%	26 10.7%	213 88.1%
Multigravida	378	5 1.3%	49 13.0%	324 85.7%

The average length of time therapy required to produce the above results was ten days, but in those who showed no change or only slight improvement after fourteen days, amobarbital, gr. 1/2, three times a day, was added to the Bonadonin therapy. The results of this additional medication are shown in Table IV.

TABLE IV. RESULTS WITH ADDITION OF AMOBARBITAL TO BONADOXIN THERAPY IN UNIMPROVED PATIENTS FROM STUDY GROUP

Group	Number	Unimproved	Improved
Primigravida	29	14	15
Multigravida	54	19	35

Combining the results obtained with Bonadonin alone and those in whom further improvement was obtained upon subsequent addition of amobarbital, 228, or 94.2 per cent, of the primigravida, and 359, or 95.0 per cent, of the multigravida were completely or markedly improved after therapy.

Surgery.—A small group of surgical (gynecological) patients was then studied as to the effect of Bonadonin upon the incidence of postoperative nausea and vomiting. Consecutive patients were chosen without any attempt at

selection especially as to the type of operative procedure. The composition of each of the groups, study and control, is shown in Table V.

TABLE V. GROUP COMPOSITION

	Study Group	Control Group
Abdominal:		
Total hysterectomy (with and without adnexal removal)	42	29
Salpingo-oophorectomy (unilateral or bilateral)	2	6
Ovarian cystectomy	1	3
Vaginal:		
Dilatation and curettage	27	34
Hysterectomy	1	1
Plastic repair	2	2
Total	75	75

The premedication employed in each case (both groups) consisted of pentobarbital, gr. 3, at bedtime on the night prior to surgery, and Demerol, 100 mg., with scopolamine hydrobromide, gr. 1/100, one hour prior to surgery. In the control group, a placebo tablet of lactose was given. Two tablets were administered at bedtime on the evening prior to surgery and two more tablets one hour preceding surgery. The same anesthetic agents were used in each case. In the study group, two tablets of Bonadonin were given at bedtime on the night before surgery and two more were administered one hour before surgery. Anesthetic induction was accomplished with sodium pentothal and maintenance was continued either with this agent alone or by the addition of small amounts of nitrous oxide and ether, in some of the longer procedures.

In this small series, no significant differences could be found on the incidence of postoperative nausea and vomiting from the type of procedure performed, the length of anesthesia or the actual combination of anesthetic agents used. Hence, no attempt was made to subdivide the results obtained into these subgroups but rather, each group was considered as a whole. These results in the two groups are given in Table VI.

TABLE VI. POSTOPERATIVE RESULTS WITH USE OF PLACEBO AND BONADOXIN IN INCIDENCE OF NAUSEA AND VOMITING

Group	Presence of Nausea & Vomiting	Absence of Nausea & Vomiting
Control Group	68 90.7%	7 9.3%
Study Group	5 6.7%	70 93.3%

In this study, only the complete absence of nausea and vomiting were considered as an adequate response to the therapy.

Conclusions

In a study of this nature, objective evidence of the results is very difficult to obtain and, in the pregnancy study at least, reliance must be placed on the subjective improvement reported by the individual. Admittedly, many other uncontrollable factors can enter into the results under such circumstances. However, in view of the striking differences between the control and study groups, this means of tabulating results was considered valid.

From the foregoing tables, it is apparent that Bonadoxin is a great advance in the management of nausea and vomiting both in the first trimester of pregnancy and in the early postoperative period.

Equally outstanding as the results themselves is the fact that the incidence of toxicity or intolerance to the medication was zero in the dosage employed in this study. The longest period of administration was three weeks to any one patient and the largest dose was two tablets in a twenty-four-hour period. The only side effect noted by any of the patients was moderate sedation, which was extreme in less than 5 per cent of patients taking the medication. This was usually noted within the first forty-eight hours after initia-

tion of therapy and became less pronounced by the addition of 2.5 mg. amphetamine sulfate once or twice daily without influencing the effectiveness of the Bonadoxin or producing any apparent toxicity.

Summary

1. Studies are presented to prove the efficacy of Bonadoxin in the relief of nausea and vomiting in the first trimester of pregnancy with a parallel control series.

2. Similar studies are given in a group of surgical (gynecologic) patients to demonstrate the relief of postoperative nausea and vomiting after administration of Bonadoxin preoperatively.

3. Toxicity and intolerance to the medication, in the dosage employed in these studies, was zero.

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MALE HYPOGONADISM

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Rheumatic Fever Survey Follow-Up Study

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WITH THE newer methods of prevention and treatment now available, it is important to know how widespread rheumatic fever continues to be so that modern treatment and prophylaxis may be utilized. In recent years, a growing feeling has developed among many physicians that rheumatic fever has been declining in incidence and prevalence and no longer constitutes a serious problem. During the five-year period, 1950-1954, an average of 187 cases per year has been reported to the Minnesota Department of Health. Since such reporting is known to be quite incomplete, accurate information as to the prevalence of the disease has been lacking. To obtain accurate current information, the Heart Committee of the Minnesota State Medical Association, in co-operation with the Minnesota Heart Association and the Minnesota Department of Health, undertook a state-wide survey to provide some of this data.

A simple questionnaire was mailed to the 3,063 members of the Minnesota State Medical Association, representing most of the physicians in Minnesota, whether practicing or not.¹ The questionnaires were mailed September 9, 1955, and by December 1, 50.8 per cent had been returned. Of the total of 1,519 replies, 597 doctors reported 2,297 cases of rheumatic fever during the twelve-month period (Table I). On the basis of this 50 per cent return it would appear that more than 4,000 cases were probably treated by physicians during the past year.

With the large number of cases of rheumatic fever reported in the survey in contrast to the small number of cases reported to the Minnesota Department of Health during the same period, two questions were raised by the Rheumatic Fever

Survey Committee. First, how many actual cases existed among the 2,297 reported cases? Second, how many of the actual cases met generally accepted criteria for the diagnosis of rheumatic fever? To answer these questions it was planned

TABLE I. REPORTED CASES OF ACTIVE RHEUMATIC FEVER, BY TYPE OF PRACTICE

Type of Practice	Questionnaires Returned	No. of Positive Replies	No. of Cases	Average Per Physician	Per Cent of Total Cases
Internist	173	73	258	3.5	11.2
Pediatrician	62	45	242	5.3	10.5
General prac.	707	456	1,725	3.8	75.0
Surgeon	166	12	48	4.0	2.0
Other	411	11	24	2.1	1.0
Total	1,519	597	2,297	3.8	99.7

to do a follow-up study of the reported cases of rheumatic fever by visiting a 10 per cent sample of the physicians, by type of practice, and to include a similar 10 per cent of the cases. A checklist was used for each case, which included identifying data as well as sex, age, Jones' major and minor criteria for diagnosis.² Each physician in the follow-up study was interviewed on an appointment basis by the staff pediatric consultant or a staff physician from the State Department of Health with special orientation in the rheumatic fever program. The physician's records of each case were reviewed for determination of the criteria used for the diagnosis of rheumatic fever.

The proposed sample drawn from 10 per cent of the reporting physicians of each type of practice and approximating 10 per cent of the reported cases included seven internists, five pediatricians, forty-six general practitioners, two surgeons, and two other types, from various parts of the state, a total of sixty-two physicians and 230 cases. In carrying out the study, however, it was found that several of the physicians could not be contacted because they were on vacation or out of town. Thus it was necessary to include physicians other than those originally selected. As a result, sixty-

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This is a joint study by the Minnesota State Medical Association, the Minnesota Heart Association and the Minnesota Department of Health, with the latter carrying out the field work.

TABLE II. PHYSICIANS VISITED BY TYPE OF PRACTICE AND REPORTED AND ACTUAL CASES

	No. of Physicians	No. of Reported Cases	No. of Actual Cases	Per Cent of Actual to Reported Cases
Internist	15	35	30	86%
Pediatrician	7	68	46	68
General prac.	41	173	144	83
Surgeon	2	5	5	100
Total	65	281	225	80%

five physicians (11 per cent) were visited. These physicians had reported 281 cases of rheumatic fever representing 13 per cent of the cases in the survey. The number of physicians visited, type of practice, and reported cases is shown in Table II.

Of the 281 cases originally reported, only 225, or 80 per cent, could be separately identified as actual cases on the basis of the doctor's records or interview. Jones' criteria for the clinical diagnosis of rheumatic fever are divided into major and minor categories. The major criteria are carditis, polyarthritis, chorea, subcutaneous nodules and erythema marginatum. The minor criteria are fever, arthralgia without polyarthritis, prolonged PR interval on electrocardiogram, laboratory tests such as increased erythrocyte sedimentation rate, leukocytosis, or presence of C-reactive proteins, preceding beta-hemolytic streptococcal infection, and previous history of rheumatic fever or inactive rheumatic heart disease. To qualify under these standards a case must have two major or one major and two minor criteria.

Jones' criteria were applied to the 225 cases actually seen by the physicians. It was found that 202 cases, or 90 per cent, qualified, and twenty-three cases, or 10 per cent, did not qualify as being true cases of rheumatic fever; 116 cases, or 52 per cent, fulfilled two major criteria; eighty-six cases, or 38 per cent, had one major plus two minor criteria of Jones. The criteria of Jones by individual major and minor categories for the series of cases are tabulated in Table III.

Carditis and polyarthritis each occurred in approximately two-thirds of the cases. There were only ten cases of chorea in the series. Fever and elevated laboratory tests occurred in almost all of the cases. A history of preceding streptococcal infection was obtained in slightly over one-half of the cases. Relatively few cases were seen in which arthralgia without polyarthritis were seen. A previous history of rheumatic fever was obtained

TABLE III. JONES MAJOR AND MINOR CRITERIA APPLIED TO SERIES OF 225 CASES

	Number of Cases	Per Cent of Cases
Major criteria		
Carditis	147	65%
Polyarthritis	143	64
Chorea	22	10
Subcutaneous nodules	5	2
Erythema marginatum	11	5
Minor criteria		
Fever	212	94
Arthralgia	42	19
Prolonged PR interval (EKG)	5	2
Elevated laboratory tests	215	96
Preceding streptococcal infection	120	53
Previous history of rheumatic fever	39	17
2 Major criteria	116	52
1 Major and 2 Minor	86	38

in thirty-nine, or 17 per cent, of the cases. There were 112 females and 113 males in the series. Of the 225 cases, 152, or 68 per cent, occurred in children under the age of fifteen years.

Summary and Conclusions

A follow-up study was done on the Minnesota Rheumatic Fever Survey of 1955. This study included 11 per cent of the physicians who had reported 13 per cent of the cases in the survey. It was found by personal interviews and review of the physician's records that 80 per cent of the cases reported on the questionnaire represented actual cases of rheumatic fever. Of the actual cases, 10 per cent did not meet Jones' criteria. This study indicated that the sample of physicians studied was meeting acceptable criteria for the diagnosis of rheumatic fever in the bulk of the cases reported.

While the study answered the question as to the prevalence and incidence of the disease, as well as the diagnostic criteria used in the diagnosis of rheumatic fever, it left many questions unanswered. Among them are the number of new cases each year, age at onset of the disease, recurrences, type and effectiveness of prophylactic treatment, duration of prophylaxis, and the necessity for follow-up of cases. An epidemiologic study of rheumatic fever would be necessary to obtain these data.

On the basis of the questionnaire survey and the follow-up study it would appear that physicians probably treated about 3,000 patients with rheumatic fever in the twelve-month period, two-thirds of whom were under the age of fifteen years. This would indicate that rheumatic fever

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Diagnosis and Management of Pleural Effusion

With Reference to Pleural Biopsy

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DIAGNOSIS and disposition of patients with pleural effusions at times becomes a major problem. Fortunately, pleural effusion secondary to cardiac, renal or liver disease usually can be recognized and sorted out from the other causes without difficulty, and effusions secondary to these causes will not be discussed in this paper. The pleural effusions that occur secondary to other diseases can usually be clasified under one of the following headings:

1. Effusions secondary to tuberculosis.
2. Effusions from pleural malignancies; usually the primary is in the lung or metastatic to the pleura from other foci.
3. Effusions secondary to pulmonary infarction.
4. Effusions secondary to non-specific inflammatory lesions in the lung.
5. Effusions secondary to subphrenic infections.

In most instances one can arrive at an accurate diagnosis through use of a careful history and physical examination combined with such laboratory aids as culture of the effusion, study for tumor cells, biopsy of the supraclavicular lymph nodes, x-ray evidence of the primary lesion in the lung itself, studies of the sputum for tubercle bacilli and tumor cells and finally, bronchoscopy and bronchograms.¹ Unfortunately, there are a group of cases in which the diagnosis is uncertain even after thorough investigation by the above methods, and it is in this later group that pleural biopsy obtained either through a thoracoscope or by direct thoractomy can be carried out without any great risk to the patient and will usually result in an accurate diagnosis as to the underlying etiology of the pleural effusion. In a few instances where one is certain the pleural space is obliterated, a needle biopsy may be adequate.²

It is necessary that the attending physician be accurate in the diagnosis as to the cause of a

pleural effusion since a misdiagnosis will frequently result in catastrophe to the patient. It has been very well shown that a pleural effusion secondary to tuberculosis either in the lung or in the lymph nodes will frequently clear without much treatment. Unfortunately, a high percentage of these patients, variously estimated to be somewhere between 7.5 per cent to 66.3 per cent, will develop, within a period usually of one to three years, clinical evidences of pulmonary or extrapulmonary tuberculosis unless the tuberculous nature of the effusion is recognized and the patient treated properly.³ Since many patients with a tuberculous pleural effusion show no parenchymal lesion in the lung and also since approximately 50 per cent of this type of pleural effusion will reveal no tubercle bacilli on culture or guinea pig inoculation, the tuberculous etiology, therefore, must be assumed and cannot be proven. It has been the custom to group this type of case under the heading of an idiopathic pleural effusion, and most physicians feel that all of these patients should undergo treatment for tuberculosis. Ideally, this means prolonged periods of treatment with drug therapy and with sanatorium care. With the history of an insidious onset of effusion in a young patient (below forty) coupled with a positive tuberculin test, one can be fairly certain of the tuberculous etiology. When the history is atypical and the tuberculin test negative or only faintly positive, it would seem desirable to have a more accurate diagnostic method to single out the occasional nontuberculous patient. From the few cases reported in the literature it would seem that where pleural biopsy has been utilized in the diagnosis of idiopathic pleural effusion a granulomatous type of lesion has been demonstrated.³⁻⁵ While no one has proven that the absence of a granulomatous lesion in the pleural biopsy definitely rules out tuberculosis as the etiologic factor, one cannot help but gain this impression from the reported experience.⁶ Our own limited experience

¹Presented at the annual meeting of the Northern Minnesota Medical Association, Bemidji, September 2, 1955.

with pleural biopsy tends to confirm this impression. Additional experience with pleural biopsy in the cases with idiopathic pleural effusion will shed much light on this subject.

The diagnosis of a pleural effusion due to a carcinomatosis of the pleura or other malignancies of the pleura can frequently be ascertained by presence of an obvious malignancy in the lung and by the presence of carcinomatous cells in the aspiration material obtained from the pleura. One has to be somewhat cautious, however, in the evaluation of carcinomatous cells in the pleural fluid since the pleural mesothelium can, as a result of irritation from other causes, exfoliate cells which simulate malignant cells. We have found pleural biopsy, usually obtained through a thoracoscope, to be a relatively simple and accurate method of establishing the diagnosis. While our experience in the numbers of cases is somewhat limited, we have to date established the presence or absence of carcinoma of the pleura in all instances of pleural biopsy and have had no false positives or false negatives. One cannot, however, rule out the possibility of a carcinoma of the lung from pleural biopsy since a patient may have a carcinoma of the lung with an obstructive pneumonitis and a pleural effusion secondary to the obstructive pneumonitis. In such an instance the pleural biopsy will show no evidence of carcinomatous metastasis to the pleura even though the patient does have a bronchogenic carcinoma of the lung. Fortunately, in this type of case one can usually arrive at the proper diagnosis through the use of the ordinary postero-anterior and lateral chest roentgenograms plus bronchoscopy and bronchograms.

Pleural effusions that occur secondary to small pulmonary infarcts may present very real diagnostic problems. Here there will be nothing very characteristic in examination of the pleural fluid. It may be either sanguineous or serous. The characteristic history of sudden chest pain associated with cough and raising of slightly blood tinged fluid may well be absent. The signs of phlebitis in the lower extremities such as swelling, positive Homans' sign and calf tenderness are very often absent entirely, particularly in the early phases of the disease. We have found that the clinician must entertain a high degree of suspicion and constantly keep in mind the possibilities of pleural effusion secondary to recurring small emboli in order to arrive at the proper diagnosis. The diagnosis is frequently one of

exclusion. One frequently is alerted to the possibility of a pulmonary embolism by such factors as bilateral involvement, the rapid appearance of new areas of infiltrate in the lung, sudden episodes of rapid pulse and dyspnea out of proportion to the visible changes in the lung, and finally by the satisfactory response to anticoagulant therapy. Since recurring pulmonary embolism even in younger individuals may prove fatal unless the condition is promptly recognized and properly treated, it is essential that this disease should always be considered when seeing a patient with pleural effusion not explained on other grounds.

Pleural effusions secondary to nonspecific pulmonary infections have become somewhat uncommon as compared to the pre-antibiotic era when empyema occurred not infrequently following a pneumonia. Today, the type of effusion that is seen following nonspecific inflammation of the lung may represent a challenging diagnostic problem, since very often the pneumonitis which has been the source of the effusion has been treated with antibiotics so promptly that it escapes detection and is, therefore, unrecognized as the source of the pleural effusion. In these cases a careful history may lead to the proper diagnosis, inasmuch as a rule these patients start out with an acute illness with a high fever and possibly a shaking chill. When an onset of illness of this type is followed immediately by the use of wide spectrum antibiotics, one is usually correct in assuming the pleural effusion represents an attenuated type of empyema. The bacteria present in these effusions may be so attenuated that they fail to grow on culture. The lysins normally produced by the bacteria present in an empyema will be reduced and for this reason a marked deposition of fibrin on the collapsed lung will occur in these attenuated empyemas. This deposition of fibrin over the collapsed lung and within the substance of the effusion itself interferes with the usual methods of drainage of the empyema and obliteration of the pleural space. Consequently, decortication of the lung and obliteration of the pleural space by use of open thoracotomy must be resorted to before these patients can be considered cured. We have seen a number of these patients treated with antibiotics alone. They appear to remain well as long as the antibiotics are continued; however, several weeks after discontinuing the antimicrobial therapy the patient again becomes slightly febrile and shows the usual signs of chron-

ic low grade empyema. These patients will remain chronically ill until the slightly infected pleural pocket is obliterated by appropriate surgery. When one sees these patients a number of months after their original infection, it is not surprising that the proper diagnosis might be confused with such conditions as tuberculous pleural effusion and carcinoma with pleural effusion. Here biopsy of the pleura will not only establish the proper diagnosis but, since it can be combined with decortication, will result in cure of the patient.

The following case history is an illustration of a patient with an effusion from an attenuated empyema.

Case Report

M. G., a fifty-four-year-old woman was admitted to Doctors Memorial Hospital March 3, 1955, with the following history. In January, 1955, she developed sudden pain in the left lower chest associated with fever. She was treated at home with several different types of antibiotics by mouth. She shortly became afebrile and appeared to recover. Four weeks later she was admitted to a hospital because of pleural effusion and at that time 1,500 cubic centimeters of fluid were aspirated from the left chest. Towards the end of February she noted dyspnea on exertion, and investigation at that time again revealed a recurrence of the left pleural effusion. On her admission to the hospital in March, the laboratory studies showed a hemoglobin of 14.5 grams, a white blood count of 7,950, and an elevated sedimentation rate of 36 millimeters in one hour. Twelve hundred cubic centimeters of slightly bloody fluid were removed from the left chest. The Papanicolaou stains showed atypical cells which were thought to be neoplastic in origin. Daily aspirations of about 1000 cubic centimeters of bloody fluid were done on her second and third hospital days. Investigation of the thyroid, breasts, kidneys, gastrointestinal tract and pelvic organs revealed no evidence to suggest a primary lesion with pleural metastasis. In addition, there was no evidence of a primary carcinoma in the lung. The patient was discharged March 9, the feeling at that time being that she had a neoplastic process of the pleura with the primary site undetermined. On March 16 she was seen in the office of her physician, and 1200 cubic centimeters of bloody fluid again aspirated. She was readmitted to the hospital March 20, 1955, for further investigation. The gross appearance of the pleura and the biopsies of the pleura revealed no carcinoma of granulomatous lesion. It was decided at this time that the patient had an attenuated empyema following a pneumonia in January, which had been treated and aborted with antibiotics. Consequently, on March 28, a decortication of the left lung was carried out. Bronchoscopy was done just prior to the decortication; this was entirely negative. The gross appearance of the pleura at this time was consistent with that of a

chronic fibrin thorax following an attenuated empyema. The entire left lung was collapsed and bound down by a fibrous peel against the mediastinum. The lingula of the left upper lobe was also contracted beneath the fibrous membrane. The lung decorticated with some difficulty; however, after decortication it expanded readily. There was no palpable disease in the underlying lung. The patient has had an uneventful convalescence. Cultures of the pleural material obtained at operation have been negative for acid fast bacilli. The microscopic study of the pleura showed no evidence of tuberculosis or carcinoma. The microscopic diagnosis was a chronic fibrinous pleuritis. She was discharged from the hospital on her eleventh postoperative day and has been well.

In a small series of pleural biopsies done in the case of patients in which the conventional methods of diagnosis did not lead to a definitive diagnosis, the results are as follows:

RESULTS OF PLEURAL BIOPSY

Patient	Preoperative Diagnosis	Postoperative Diagnosis
1. E. S.	_____?	Mesothelioma
2. W. H.	Carcinoma?	Fibrous Pleuritis
3. M. B.	Tuberculosis?	Fibrous Pleuritis
4. M. G.	Carcinoma?	Attenuated Empyema
5. Z. B.	Carcinoma?	Carcinoma

Summary

The etiology and treatment of pleural effusion secondary to disease of the lung or pleura may at times be impossible, utilizing the conventional diagnostic methods. The common causes of pleural effusion are those secondary to tuberculosis, those secondary to metastatic carcinoma in the pleura, effusions secondary to pulmonary infarction and effusions secondary to nonspecific inflammatory lesions in the lung. The results of an improper diagnosis may be disastrous for the patient. It is suggested that in the occasional patient where conventional diagnostic methods fail to prove the diagnosis, pleural biopsy be done in an effort to establish a more accurate clinical diagnosis. Pleural biopsy is a procedure which is not hazardous to the patient and a procedure that will enable the clinician to arrive at an accurate diagnosis. The results of a small series of pleural biopsies are summarized.

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Case Presentation

Acute Emphysematous Cholecystitis

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SINCE Hegner¹ recognized emphysematous cholecystitis roentgenographically in 1931, the total number of cases reported has reached fifty-two.² Previously the entity had been recognized only at autopsy or laparotomy. The disease, also known as acute pneumocholecystitis, consists of the presence of gas in the gall bladder, often associated with an interstitial emphysema of the gall-bladder wall. The source is probably anaerobic gas forming organisms which have been harbored in the liver and which are normally nonpathogenic. These are likely secondary invaders which complicate the picture of acute cholecystitis by the formation of gas in and about the gall bladder.³ The disease is more common in male subjects and is often associated with diabetes mellitus. Gallstones are usually present.

The location of the gas in the gall-bladder wall is submucous, as has been shown by gross and microscopic examination of specimens.⁴ However, gas may extend into the pericholecystic tissues in more extensive infections. This explains the characteristic roentgenographic findings which consist of an intraluminal air fluid level surrounded by a halo of lesser density representing gas within the gall-bladder wall. The biliary tree is not outlined by air as in instances of biliary fistulae.

Since emphysematous cholecystitis is associated with an increased incidence of gangrene of the gall bladder and an increased mortality, early cholecystectomy appears to be the treatment of choice.³

Case Report

History.—A sixty-eight-year-old alcoholic, unmarried white laborer of Polish extraction was admitted to Ancker Hospital, December 5, 1955. He complained of abdominal pain, tenderness and distention of four days' duration, and stated that this had been preceded

for ten days by pain in the right flank which radiated to the abdomen. He had vomited several times and thought that the vomitus had been bloody and his urine darker than normal. Shortness of breath and nocturnal dyspnea had been present for two weeks. For several years, he had had urinary frequency, dysuria, urgency, and nocturia. He had no previous dietary difficulties or abdominal distress.

Physical Examination.—On examination the temperature was 102° F, pulse rate 100 per minute, respiration 40 per minute, and blood pressure 105/70.

The patient was obese, confused, orthopneic and complained of abdominal pain. He was slightly cyanotic and had minimal icterus. The heart was totally irregular but no murmurs were audible. A few moist rales were present at the bases of both lungs. His abdomen was distended and tympanitic. A smooth tender mass could be felt extending six centimeters beneath the right costal margin. The entire abdomen was tender and there was rebound tenderness referred to the right upper quadrant. The bowel sounds were normal. Aside from moderate prostatic enlargement rectal examination was normal.

Laboratory Findings.—The hemogram was normal except for a moderate polymorphonuclear leukocytosis. The urine contained albumin, casts, and occasional erythrocytes and leukocytes but no sugar. The serum bilirubin totaled 4.0 mgm. per cent, of which 3.2 mgm. per cent was determined by the direct reaction. The cephalin flocculation was 2 plus in twenty-four hours.

The electrocardiogram showed auricular fibrillation.

Roentgenographic Findings.—Roentgenograms of the abdomen revealed an area of radiolucency in the right upper quadrant which corresponded in size, shape, and position to the gall bladder. This was surrounded by a ring of decreased density (Fig. 1). An air fluid level was present within the shadow. Roentgenographically the diagnosis was acute emphysematous cholecystitis. There was minimal small bowel gas and some gas within the colon (Fig. 2). No free intraperitoneal air was evident. A roentgenogram of the chest showed moderate cardiac enlargement and congestion of the lungs.

Course in the Hospital.—The patient was digitalized and placed on large doses of antibiotics. Combined

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tentanus-gas gangrene antitoxin in therapeutic amounts was administered.

At 5 p.m., December 6, 1955, under general anesthesia, the patient was explored through a right sub-

costal incision. The gall bladder was found to be tense, thin walled, partially gangrenous, and walled off by adherent omentum and adjacent viscera. When the adherent omentum and transverse colon were freed from the gall bladder, free bile was encountered. Aspiration of the gall bladder revealed that it contained 40 cc. of gas. A cholecystectomy was done. The region of the common duct was examined but no dilation or stones were found. Because of the patient's poor condition and the severe infection and reaction in the tissues about the cystic and common duct, a common bile duct exploration was not done. The wound was closed with drainage of Morison's pouch. The night of the operation the patient pulled out the Penrose drain but nevertheless ran a benign course, his highest temperature being 101.2 degrees rectally on the third postoperative day. His serum bilirubin promptly reverted to normal. Later studies provided evidence of minimal diabetes mellitus.

Pathologic examination of the gall bladder revealed it to be gangrenous. The mucosa was raised from the

submucosa and a dense polymorphonuclear leukocytic invasion of the wall was present. No stones were found in the specimen and none were encountered during the operation. Aerobic cultures of the gall-bladder contents showed no growth. Anaerobic studies, unfortunately, were not done.

Summary

The fifty-third case of acute emphysematous cholecystitis has been presented. A brief discussion of the characteristic features of the disease is included.

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continues to be a prevalent disease and constitutes a serious problem in Minnesota. Physicians and the public should be aware of the importance of early diagnosis, the availability of effective treatment and the necessity for long-term prophylaxis.

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Continuation Study

Abdominal Injuries

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ETYMOLOGIC consideration of the word *abdomen* indicates that *hidden* may well be its meaning. The anatomic structures which are so hidden are peculiarly liable to injury from closed or open wounds, and the effects of such injury are particularly lethal. Therefore, constant thought of the danger which is *hidden* and the employment of tactics designed to extract from this place of concealment pertinent diagnostic facts early enough to allow timely treatment are the absolute prerequisites for successful management of trauma in this area we call the abdomen.

Of first consideration when clarifying concepts of the problem of trauma is the matter of attention to the wounded person where he or she may initially be found. Almost always this attention is conducted by lay individuals of varying experience. To those who may receive instruction from us in such matters, e.g., ambulance drivers, litter bearers, police, first aid students, et cetera (a group of people who are greatly increasing in number commensurate with civilian defense activity) succinct instructions are in order. In this discussion, general principles of transportation and resuscitation are omitted and mention made only of factors relative to the abdominal injury itself. The noneviscerating abdominal wound should simply be covered with a sterile or clean, small dressing. When evisceration has occurred, no attempt at gut replacement is in order at this time. A sterile or clean voluminous dressing over the exposed viscera, held in place by a firm bandage encircling the trunk, is practical and of value. Only when protracted (days) exposure is likely should moist dressings be considered, and even then their value is dubious. Transportation to an effective center for definitive treatment by the most rapid and direct method available is indicated. Any theoretic danger of removal via air based on relationship of atmospheric pressure to intraluminal visceral pressure is far outweighed

by the material advantages gained through the rapidity of transportation which allows early surgical repair with its attendant benefits. Once applied, dressings should remain in place until they can be removed by the surgeon responsible for care of the injury. Each dressing change in these wounds, as in others, affords another opportunity for bacterial contamination and usually serves no useful purpose. Administration of morphine at the time of injury may be of value. If given, it must be noted unmistakably on a record attached to the patient.

Upon arrival at a hospital, a history of the accident together with a brief pertinent examination furnishes the basis for assessing the problem at hand. Simultaneously, resuscitative measures may be begun in the emergency room and on the way to the hospital bed. A scout x-ray film of the abdomen should be taken. Crossmatching for blood transfusion and obtaining a blood sample for hemoglobin and hematocrit values form another essential part of this workup which is best started immediately in the emergency room. Time is important. Mortality is often directly related to time elapsed between injury and treatment. We have repeatedly found that the baseline established rapidly by prompt history, physical examination, scout film of the abdomen, urinalysis, hemoglobin and hematocrit determination is invaluable.

With the foregoing general considerations in mind more specific discussion of the problem at hand is in order. Classification is simple and further subdivision than open and closed wounds is unnecessary.

Closed Abdominal Wounds

Many of these injuries will obviously be trivial and need no further attention. We are concerned in this discussion with those of serious potential or actual degree. The abdominal wall suffers a contused wound with or without partial or complete division of muscular or connective tissue

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components. Hemorrhage there can occur from the intracutaneous position to the immediately extraperitoneal. Any intra-abdominal structure may be injured. Damage to hollow viscera may occur more frequently at their points of fixation. Damage is often secondary to skeletal injury from pelvic or rib fractures. The true appreciation of the word *hidden* can be well understood by him who surveys the injured abdomen of this type. One's duty, however, is remarkably clear. Unless he is prepared to prove unequivocally that no visceral damage has occurred, hourly or more frequent clinical, laboratory and x-ray examination must be done until the sixth post-injury hour. If after this period of time any symptoms or signs of peritoneal irritation, with or without evidence of intra-abdominal hemorrhage remain, surgical exploration of that abdomen is indicated. This rule may seem unnecessarily harsh and leave little room for the so-called conservative treatment of these injuries. If one waits for evidence of exsanguinating intra-abdominal hemorrhage or far advanced inflammatory changes throughout the peritoneal cavity, he is fortunate indeed if mortality can be avoided. Antibiotic drugs and blood transfusions are no substitute for closure of a hole in the gut by suture, or ligation of a bleeding artery. Again, I must emphasize that we are dealing with something which is *hidden* and the signs apparent to us especially in the early period may be slight indeed. What are these signs and symptoms—how are they elicited, interpreted and judged? Persistent abdominal pain with tenderness to palpation, especially if associated with some degree of muscle spasm and rebound tenderness, is the first warning sign along the way. Evaluation of tenderness and muscle spasm may be difficult relative to true location and degree. A nervous, apprehensive, recently injured patient often is not a good subject for precise evaluation of these findings. If one will prepare one quarter grain of morphine in 10 cubic centimeters of water and administer it fractionally over a period of five minutes by the intravenous route, discontinuing injection at the moment that the patient obviously begins to relax, valuable information may be secured.¹ Slight and irrelevant degrees of abdominal tenderness disappear and along with this much of the voluntary muscle spasm. Muscular rigidity and some degree of tenderness now tend to become sharply localized over the area of pathology. If such abdominal

findings remain after this degree of analgesia, serious import must be attached thereto. It must be realized that this procedure should be done by the surgeon who is to accept final responsibility for the case at hand and he should examine the patient before and after morphinization. It is often wise when such localization has been secured to prepare the skin of the abdomen and insert with the aid of local anesthesia a short beveled needle into the peritoneal cavity and aspirate its contents. If one obtains blood, recognizable intestinal content, bile or dye previously ingested into the stomach, the information secured is indeed valuable. The use of a needle large enough to admit a polythene tube which may be inserted deep into the abdomen thereby reaching more areas has been suggested. In view of the great difficulty of adequately sterilizing such tubing, we do not recommend its use for this purpose at present. Pain referred to the shoulder strap area is suggestive of diaphragmatic irritation. It may occur on the left when the spleen is ruptured (Kehr's sign). Vomiting often occurs at the time of injury and usually does not recur until late. Abdominal distention is likewise a late sign and should not be awaited. Shifting dullness in the flanks due to the accumulation of blood in the peritoneal cavity is not a sign amenable to easy interpretation in acute injuries. The appearance of blood in the rectum or urethra is pathognomonic of injury in the lower reaches of the bowel or somewhere in the genitourinary tract. Discussion of these injuries in detail does not fall within the scope of this paper. Suffice it to say that such occurrence must be immediately investigated. At times, rapid early tumefaction localized to one or another portion of the abdominal wall may be seen. This is usually indicative of a hematoma forming there. Careful physical examination of the chest should never be omitted. When, following injury to the upper abdomen or chest, the cardiac dullness shifts to the right, breath sounds disappear on the left and dullness or tympany are noted in the left chest, the possibility of traumatic diaphragmatic hernia must always be considered. Rarely a diaphragmatic tear occurs on the right. Unrecognized strangulation of these herniae is associated with an extremely high mortality.

Classic signs of hemorrhage, i.e., air hunger, pallor, low blood pressure, and a thready, rapid pulse, may be associated early with attendant

hemoconcentration effectually masking common laboratory findings indicative of anemia. Volumetric red blood cell mass and plasma determinations do clarify this problem and may be used advantageously to estimate the degree of hemorrhage and necessary blood replacement volumes. If intra-abdominal hemorrhage is slow or intermittent, as is often the case, falling hematocrit and hemoglobin values are diagnostic.

X-ray examination of the abdomen in the lateral decubitus, flat and upright positions is often very helpful. One must remember to examine the films in a slow methodical manner thinking of each organ, system and structure singly. It is valuable to develop a routine method of doing this in order to avoid missing obvious findings. Free gas demonstrable under the diaphragm or under the parietal peritoneum in the lateral decubitus position is positive proof of a ruptured hollow viscus. It is an early sign in a high percentage of stomach and colon injuries. It occurs somewhat later in small bowel lacerations. Tears of the retroperitoneal portions of the duodenum are manifested by gaseous shadows along the psoas border, occasionally outlining a kidney or often appearing as multiple longitudinal streaks in the duodenal area. Splenic tears with masses of softly clotted blood accumulating in the left subdiaphragmatic region may displace the stomach gas bubble medially and inferiorly. At times an increase of density suggesting a mass will be seen in the left upper quadrant. Fractures of the lower ribs on either side are significant, for one may puncture the liver or spleen. Esophageal tears may be manifested by streaking of gas longitudinally in the mediastinum. Elevation or irregularity of a diaphragm is generally the first clue to a diaphragmatic hernia. Hemorrhage from a torn kidney may obscure the renal shadow or psoas margin or both. Fractures of the pelvis automatically bring to mind the possibility of bladder or urethral injury. Cystograms furnish a safe, simple confirmatory procedure in this instance. Intravenous pyelography will usually demonstrate renal lacerations. It should be remembered that sacral fractures may be associated with injuries to the pelvic colon at its point of relative fixation. Fractures of the vertebrae with their rather regularly attendant ileus because of retroperitoneal hemorrhage frequently explain the presence of abdominal distention. The presence of radiopaque foreign bodies is usually obvious

and often of value in ascertaining the likelihood of injury to one or another structure. Usually the administration of contrast material by mouth or rectum is unnecessary and may be dangerous at times. However, a small amount of diodrast will be helpful especially in lower esophageal tears.

When these clinical, laboratory and roentgenologic features are classic, the diagnosis and proper therapeutic procedures are clear cut. The difficulty lies in making the proper diagnosis before the findings are obvious. A high index of suspicion with a thorough knowledge of the implications of suggestive findings is necessary. Surgical exploration at this time pays great dividends. If the ruptured spleen is removed at the first moment in which one begins to think of it as a possibility, far more pleasant surgical experiences will be accumulated and fewer surgical adventures will occur. The structures involved are *hidden* and in the last analysis any sound, though slight, evidence of damage must be thoroughly investigated.

Treatment of closed abdominal injuries resolves itself into two aspects, i.e., the necessity for systemic treatment and the necessity for local therapy to the abdomen and its hidden contents. The alleviation of pain, apprehension and restlessness by morphine is universally acknowledged. Yet one must never narcotize an individual carelessly to a point where real symptoms are masked. Morphine ordered freely to be given at the discretion of the nursing staff has stifled many an outcry which, if brought to the surgeon's attention, would have enabled him to recognize serious symptoms. These drugs should be used intelligently and only in doses which do not further *hide* the already *hidden*. When shock is present, the treatment of choice is whole blood administered intravenously. Plasma and artificial plasma expanders are useful as interim agents. It is almost always a mistake to operate upon an individual in shock. Resuscitative measures, which in the main consist of whole blood administered rapidly by one or more routes, will restore blood volume to a point where anesthesia and operative intervention can be safely undertaken. If the patient survives long enough to come to the surgeon's care, bleeding will have been slow enough or sufficiently arrested to allow preoperative restoration of a large measure of his blood volume. The others will have died of exsanguination beforehand. At this point vasopressor drugs are of no

value and may be harmful. If one has reason to suspect intraperitoneal bacterial contamination, penicillin and dihydrostreptomycin should be administered as soon as possible and are the antibiotic drugs of choice unless objective evidence is secured that another will be more effective. One never treats an abdominal injury solely with these agents—they are only an adjunct to the well-defined principles of operative therapy shortly to be discussed. Preoperative medication of atropine or related substances and morphine are well standardized. It is well to remember that in the injured patient subcutaneous or intramuscular administration of drugs may be attended by slow or irregular absorption. For this reason, intravenous administration is advantageous. Preoperative emptying of the stomach is imperative. For lack of it, individuals have drowned in their own stomach contents when vomiting occurs during induction of anesthesia. The most practical way to empty the stomach in emergency cases is to induce vomiting in the conscious patient. Do not rely on the use of a tube—a sense of false security may ensue with disastrous consequences to the patient. An indwelling intragastric tube attached to suction is helpful during anesthesia in keeping the stomach empty. Gas, especially, may be forced down the esophagus by the anesthetist's efforts to assist respiration, and gastric dilation ensues, making the operative procedure far more difficult. Insertion of a nasal tube can of course be done then, but it is harder and more time consuming.

The choice of anesthesia in the last analysis rests on that agent or agents with which the surgeon and anesthetist are most familiar and can use to best advantage. For an anesthetist, who 98 per cent of the time employs a nitrous oxide-ether inhalation technique, suddenly to switch to cyclopropane because he is dealing with an injured individual is foolhardy and dangerous. If the anesthetist will maintain a clear airway at all times, ventilate the patient properly in an effort to avoid respiratory acidosis, and supply the surgeon with a reasonable degree of anesthesia fitted to the procedure at hand, it probably makes little difference what anesthetic agent is used. Rapport must exist between surgeon and anesthetist to make sure that they operate as a team and not each go a separate therapeutic way. If unnecessary depth of anesthesia is avoided and adequate ventilation maintained through a patent

airway, critically injured patients may be anesthetized with safety. In the absence of skilled specialists in anesthesiology, highly potent agents such as cyclopropane are best avoided unless the administrator thereof is practiced and competent with them through daily familiarity. If diaphragmatic lacerations complicate abdominal injury, remember that the surgically opened abdomen then communicates with the chest, and controlled respiration, preferably through an intratracheal tube, is necessary. It is well also to recall that direct infiltration of novocaine into the abdominal wall, peritoneum or splanchnic region affords an admirable adjunct to general anesthesia at a light plane. Supportive therapy during surgery in the way of blood transfusion may be necessary. An intelligent effort to estimate the blood loss by weighing sponges and measuring losses in suction bottles should be made. Correlation of this with preoperative estimates based on the amount of blood already given, hemoglobin and hematocrit values and preferably quantitative blood volume determinations should be made. Transfusion should not be for psychic comfort to the surgeon or anesthetist but for the replacement of actual blood lost. The dangers of overtransfusion are real and the detection of incompatibilities of the blood administered may be heavily masked by anesthesia. Recently we have found that actual determination of red blood cell mass and plasma volume while surgery was in progress was not difficult or cumbersome, and afford a reliable measurement of the exact situation (Evans blue dye method). Similarly one should avoid overloading of the body with water and salt. Trauma elicits endocrine and mechanical responses which tend to conserve these substances. Therefore, large quantities of either need not and should not be given during acute phases of injury unless objective evidence indicating their need exists.

If an exact preoperative diagnosis can be made, an incision designed adequately to expose that region should be used. Long muscle splitting right rectus incisions are poor companions for surgeon and patient. They have the greatest tendency to dehiscence, are more painful with attendant ipsilateral thoracic splinting, and contribute more frequently to postoperative herniae than any others. Well-executed transverse or longitudinal midline incisions which may be combined if need be are far more suited to the

patient's needs. In the absence of precise knowledge concerning the organ involved, a good guide to incision is the point of maximum tenderness or spasm. At times it may be necessary to extend incisions into the chest with or without dividing the diaphragm or resecting a rib. Thoraco-abdominal wounds in particular may call for this. Removal of blood, debris and devitalized tissue, together with hemostasis in the chest cavity, obviate the necessity later for many pulmonary decortications and prevent development of stubborn empyemata. Catheter drainage of the chest with slight negative pressure (8 centimeters of water) or underwater seal is usually advisable following this procedure.

When the peritoneal cavity is opened, immediate observation of its contents is important. The presence of gas, bile, blood or feces and the presence or absence of serosal inflammation, together with the character of the exudate, often furnish an immediate guide to the source of trouble. Sites of injury identified should be tagged in the case of perforated gut with suitable clamps which mark the injury and temporarily close the perforation to prevent further contamination. The source of active hemorrhage should immediately be located and dealt with. Painsstaking examination of the gut from esophagus to anus should then be carried out. Missed perforations are a common cause of death. Injury to retroperitoneal areas should be thought of and searched for. The stomach must be examined in front and in back. If necessary, the gastrocolic ligament must be divided and the lesser sac explored. The pancreas, spleen, liver, gall bladder and bile ducts, together with the duodenum, are looked at carefully. If one suspects a duodenal tear in the retroperitoneal portion, mobilization of the colon should be carried out so that the duodenum may be exposed, examined and repaired if necessary. A ruptured spleen necessitates splenectomy. Lacerations of the liver are closed by deep mattress sutures after any devitalized tissue has been removed. Ligation of large vessels and ducts within the liver substance is practical and greatly aids hemostasis and biliary stasis. Placement of a soft Penrose drain around the hepatic pedicle, so that the hepatic artery and portal vein may be intermittently occluded, is at times of great value in controlling blood flow from the torn liver surfaces. Placing a gelfoam pad between the torn surfaces as an adjunct to suture is of help. Adequate

drainage of liver injuries is necessary for often much bile leakage occurs. A ruptured gall bladder should be removed. Common bile duct injuries usually are associated with retroperitoneal infiltration of bile especially in the region of the gastrohepatic ligament. This makes location of the site of injury difficult. If it can be found, careful repair should be done, supplemented by T-tube duct drainage. If the tear cannot be found, T-tube drainage alone must suffice. Pancreatic injuries necessitate hemostasis, excision of dead tissue, repair if possible, and adequate drainage. This may be of value in preventing subsequent cyst formation. Mesenteric hematomata are ordinarily allowed to remain undisturbed provided they are not unduly large or associated with obvious active bleeding or definite circulatory embarrassment of the bowel. Small lacerations of the bowel are best closed in two layers with special attention being given to preventing constriction of the bowel lumen. If lacerations are extensive in degree or numerous in an isolated area, resection of the damaged segment with immediate end-to-end anastomosis is preferable. There are virtually no circumstances which justify exteriorization of small bowel with the thought of later restoration of continuity. If resection and anastomosis are indicated they should be done immediately and the bowel replaced in the peritoneal cavity. Injuries of the colon must be carefully assessed on the basis of degree of damage, extent of peritoneal contamination and circulatory status of the gut wall. Colon injuries which are any more than puncture wounds, especially if associated with extensive peritoneal contamination or additional damage to other structures, should be exteriorized and handled as any temporary colostomy. If resection of a portion of the colon is found necessary, primary anastomosis is not indicated. The two limbs of the bowel should be brought out as a double-barreled colostomy, perhaps using a Rankin clamp. When anatomic location renders exteriorization unfeasible, as for example low in the pelvic colon, proximal colostomy must be done unhesitatingly if there is any doubt about the closure from the standpoints mentioned previously. We must not be misled by the sense of security established by continued experience with the prepared empty colon found in the elective surgical case. Acute injuries to the unprepared bowel are dangerous and must be handled circumspectly. It is in this

type of problem that antibiotic therapy does much to lessen the threat of sepsis from peritonitis or wound infection.

Drainage of the peritoneal cavity is a moot point. It is our feeling that, if a hole in the gut wall cannot be closed or if the closure be precarious, one or two Penrose drains from that site to the outside are of value. If the pancreas or liver are injured, copious quantities of bile or pancreatic juice may exude and should have the aid of established external drainage. Expecting the entire peritoneal cavity to be drained for the treatment or prevention of generalized peritonitis through one or more rubber drains is foolish. If tissue that is actually or questionably devitalized must be allowed to remain in the belly, external drainage of the area may be of benefit. The thought of draining the abdominal wound, especially if it is heavily contaminated, has merit and may occasionally prevent abscess formation under tension. The history of abdominal surgery is replete with description of the use of chemical or biologic agents placed in the peritoneal cavity to prevent or treat infection, diminish adhesion formation or promote healing of anastomotic sites. None have stood the test of time and many have proven to be dangerous. Hope is eternal in the surgeon's breast and at present the thought of placing several small polythene tubes in different areas through small puncture wounds in the abdominal wall made before closure for the purpose of instillation of antibiotic agents is being considered. Sterilization of polythene tubes is still a major problem accomplished best at present by high intensity beta or gamma radiation. Careful closure of the operative incision so that large amounts of foreign material, and dead space to allow collection of serum and blood, do not remain is important. Careful hemostasis with absence of tissue devitalized by ligature, suture or cautery promotes kindly healing. The wound closure too must have sufficient strength. There is much to be said for a one layer through and through suture closure in any abdominal incision in which postoperative complications are likely.

Postoperative care varies with the type and extent of injury. Early mobilization of the patient is advocated and practical. If fractures or other associated injuries prevent this, a routine of bed exercises should be employed. Remember that patients may be effectually immobilized by means of morphine or related drugs. These must be used

sparingly and for a short period of time only, if complications due to circulatory, respiratory or musculoskeletal stasis are to be avoided. If a valid reason exists for antibiotic therapy, it should be employed. Tetanus toxoid as a booster injection is indicated in the immune and antitoxin in large doses in the unimmunized individual. Gas gangrene antiserum is of questionable value and is followed by many severe allergic reactions. Decompression of the gastrointestinal tract through indwelling catheters for a short period postoperatively does combat abdominal distention especially in individuals who tend to swallow air. One must constantly remember that its prolonged use is dangerous. Even though the loss of water and electrolytes from the body which it causes can be calculated by nice mathematical formulae and exactly replaced, it is far better to produce no such deficits in the first place by allowing oral ingestion of food and water at the earliest possible date. With this principle in mind, each case will present individual requirements and the bounds of safety will not be overstepped. Blood transfusion is usually not necessary during this time unless continued blood loss should occur. Management of drains and general wound care differ only from elective surgical cases in that the likelihood of bacterial contamination is great if the gut has been perforated. Therefore, signs of sepsis should be searched for frequently and dealt with as and if the occasion arises. Concomitant injuries should be treated in the order of their priority. If early and proper resuscitative, diagnostic and therapeutic procedures are followed, the postoperative course should not differ greatly in manner from elective abdominal operations.

Open Abdominal Wounds

The nature of the physical agent producing the open abdominal wound is of considerable importance. Small pointed objects, such as the ice pick, produce injuries which differ greatly from those inflicted by the large jagged shell fragment. High velocity (2000 to 2800 feet per second), small caliber (30 or less) hard nose bullets at near to medium range more nearly resemble the ice pick injury than does the low velocity (1000 to 1500 feet per second), large caliber (45 or over) projectile at shorter ranges. The devastation produced by a shotgun blast at close range is a definitely different diagnostic, therapeutic and potentially lethal problem than a single puncture from a .22

caliber rifle. Certain small caliber super velocity rifles (3000 to 4000 feet per second) often tend to produce explosive effects on striking flesh due to disintegration of the projectile on impact. So, in approaching the problem of outlining our plan for management of open abdominal wounds, the exact nature of the wound itself is of prime importance. While it might be perfectly proper to remove and replace a colon which presented two small puncture wounds, similar procedure with a badly lacerated bowel and mesentery could well lead to disaster.

Much of what has been said previously in regard to closed injuries also applies to open abdominal wounds. They differ only in that the indication for surgical exploration of the abdomen is far more clearcut and that one has the additional problem of managing the wound of the abdominal wall. It is safe to say, and has been said many times before, that, unless definite proof exists showing that penetration of the peritoneal cavity did not occur, all such abdomens must be surgically explored. The wounds of entrance and exit are handled as other contaminated wounds. They are excised and closed if possible. If the wound is in the region of the proposed surgical incision, this may be accomplished at that time. If the wound is massive and extensive, careful debridement, irrigation and primary closure of at least the peritoneal cavity must be done with adjacent tissues, mobilized flaps, pedicles, free grafts or prostheses. The norms already established regarding treatment of contaminated wounds must be applied here as elsewhere in the body.

The probability of multiplicity of the wounds especially in relation to the gut is great in this type of abdominal injury. One must never forget that the stomach presents a puncture wound in front most likely has also been perforated posteriorly. Numerous perforations of small bowel or colon may occur. Injury to any of the solid viscera is common, alone or in combination with other intra-abdominal wounds. Most thoracoabdominal injuries are of this type and follow gunshot or stab wounds. It is important to keep these features in mind for the implications are obvious.

Careful, thorough examination of the injured areas must be carried out in order that nothing be missed. The open abdominal wound is far more likely to cause injury to major blood vessels. Probably in many instances such wounds are rapidly fatal. Some patients will survive and develop false aneurysms or arteriovenous fistula. Most injuries to large vessels will escape notice at the original exploration, masked by large retroperitoneal hematomata which usually are best left undisturbed. If major vascular injury can be identified or marked extensive circulatory embarrassment of intestine or extremities is present, immediate restoration of vascular continuity by repair, anastomosis, autograft, homograft, or prosthesis is indicated. Little or no time should be spent in search for foreign bodies. Metal is often well tolerated in the soft tissues indefinitely and if troublesome can be approached later. If extensive retroperitoneal bacterial contamination is present, especially if associated with a pelvic or hip joint fracture produced by the same missile, adequate provision must be made for drainage through the flank. Large retroperitoneal abscesses, dissecting extensively are prone to form under these circumstances and a drainage channel is helpful.

General preoperative, operative and postoperative considerations as outlined in some detail under discussion of closed abdominal injuries apply to this type of wound as well.

Summary and Conclusion

Intra-abdominal injuries are of infinite nature, variety and extent. They may occur in the open or closed type of abdominal wound. Their lethal potentiality is great and it is to be constantly remembered that they are *hidden* from view. Intelligent application of reasonably simple methods of resuscitation, clinical, laboratory and x-ray examination will generally point out the correct therapeutic path to follow. In the event of doubt, surgical exploration of the abdomen must be carried out without unreasonable delay.

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Current Concepts

Smoking Is Detrimental In Asthma and Emphysema

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PATIENTS who have asthma must be advised not to smoke tobacco.¹⁻³ The same advice should be given to patients who have emphysema. The reasons for such counsel are clear and definite. Smoking induces cough and bronchitis, and the latter in turn causes bronchospasm and symptoms of asthma, possibly terminating in irreversible emphysema.

All patients who have asthma already have some degree of bronchitis. When observed bronchoscopically, the membranes are swollen and red and are covered with a protective layer of mucus. The bronchi usually exhibit some degree of spasm. Air passages in such condition are hypersensitive to such noxious stimuli as dust, smoke, fumes, cold air and strong odors. Therefore, it is most unwise and illogical for the patient who has asthma, bronchitis or emphysema to irritate further his bronchial mucous membranes by voluntarily inhaling smoke into an already hypersensitive respiratory tract.

With the aid of high-pressure selling through the mediums of television, radio and printed material, smoking is perhaps the commonest cause of irritation of the respiratory tract. All physicians are acquainted with "smoker's tongue," "smoker's cough," "smoker's throat" and "smoker's bronchitis." When smoking is stopped, these effects clear up promptly in most instances. It is not uncommon to see patients with daily asthma who state they would give anything to get better. They follow their doctor's advice in regard to taking injections, they avoid dust, danders and other allergens, and they use their antiasthmatic drugs conscientiously, yet during all this time they continue to irritate their respiratory tracts with

tobacco smoke. When the patient is advised to stop smoking completely, the comment is often made that he never had been advised before to stop but just to cut down a little on his smoking.

As an irritant to mucous membranes of the respiratory tract, tobacco smoke causes secretion of mucus. Mucus protects membranes from smoke or other respiratory irritants. Many asthmatic patients then cough vigorously to bring up this protective mucus. However, the more they cough, the more mucus is formed and this, in turn, is coughed up, so that a vicious cycle of coughing and wheezing is perpetuated.

One of the most neglected problems in the management of asthma is the control of overcoughing. One of us (Prickman^{3,4}) stressed the impossibility of controlling asthma as long as cough is uncontrolled, no matter what the reason for the continued cough may be. Some patients cough so violently that they fracture ribs or experience tussive syncope. Such patients must be educated to accept mucus as a normal protective covering to be left on the membranes and not to be raised by severe coughing. Any excess of mucus formed in the lower air passages is expelled with the aid of cilia in the bronchi and trachea. When this excess mucus tickles the upper portion of the trachea, the throat should be cleared gently raising only the small amount of mucus in the upper part of the trachea. This mucus often is so thick and dry, or even formed in plugs or casts that it is almost impossible for the cilia to raise it. Likewise, strands of sticky mucus may stretch across the trachea like violin strings. These secretions must be thinned out by means of hydration and expectorants so that they can be raised without coughing.

Thus, anything that causes cough must be avoided, and smoking is one of the commonest

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Neuropathic Arthropathy

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EXTENSIVE painless articular deterioration is usually due to one of three causes: tabes dorsalis, syringomyelia, or diabetes mellitus. The lesion has been reported, however, in a number of diseases which have hypesthesia as a common denominator.

Associated Diseases

This affliction has been reported to occur with paresis, leprosy of the neural type, and cerebral palsies; with spinal cord and posterior root lesions—infectious, neoplastic, and congenital (spina bifida); and with peripheral nerve diseases including toxic neuritis, injuries, and cervical ribs. It has been noted in pernicious anemia and in “congenital indifference to pain.”¹⁻⁴ Robinson and associates² cited poliomyelitis as a possible cause (but did not give a reference). This is the only instance of the disease in the absence of sensory disturbance.

Clinical Aspects

Site.—The large joints of the lower extremity are the most commonly affected. In tabes the knees and hips are most extensively involved and in diabetes the ankle and foot joints.^{1,2} In syringomyelia, on the other hand, arthropathy occurs in the upper extremity, i.e., in the elbow and shoulders. Charcot joints may also occur, however, in the hands, spine, and jaw. The lesions are usually monarticular.^{6,7}

Neuropathic arthropathy appears as a painless joint enlargement through which multiple bony excrescences can be felt. Effusion is uncommon, as are heat and redness. Gross instability and crepitation are characteristic.^{1,2}

The deformity and destruction may develop slowly, but one striking feature is the rapidity with which they are sometimes seen to take place.

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Pemberton⁸ stated that changes may develop more rapidly in this type of arthropathy than in any other form of arthritis. Vertebral collapse with cord compression may result from spinal involvement.^{7,9}

Syphilis.—Charcot joints develop in about 1 per cent of patients with syphilis and in 5 to 10 percent of tabetic patients. They are usually associated with physical, serologic and anamnestic evidence of lues, and are more frequent in tabetic women. They must be distinguished from the less common syphilitic arthritis.^{1,2} Although usually monarticular, they may affect several joints. Goodman⁵ described a patient with changes in both knees, both elbows and the spine.

Syringomyelia.—Neuropathic arthropathy occurs in 25 per cent of patients with syringomyelia.² The most common joints affected are the shoulder and elbow.⁷ The extent of the destruction is not as great as in the lower extremity.¹

A recent review⁹ of twenty-two patients with syringomyelia revealed that seven had arthropathy. In some closely followed cases it was discovered that soft tissue swelling may precede x-ray changes by as much as six weeks. It was interesting to note that 50 per cent of their patients had pain in the joints at some time.

Diabetes.—A Boston group¹⁰ reported arthropathy in seventeen of 20,000 persons with diabetes (1 in 1100). The average age of the patients was fifty-six (thirty to sixty-nine) and they had had diabetes for an average of eleven and one-half years. Three of the patients had positive spinal fluid Wassermann reactions and two had abnormal colloidal gold curves. The cerebrospinal fluid protein was elevated in eleven of fourteen patients; the average was 69 mg. per 100 ml.; none was over 100. Of the seventeen patients, fourteen had other evidence of neuritis, but only four had “neuritic pains.” Two had “diabetic diarrhea.”

Arterial circulation was judged adequate in all but one.

The authors compared findings in diabetes with those in syphilis. They noted that in syphilis the onset is more commonly acute, with swelling, fluid and some pain in the acute stage. New bone formation and sclerosis of bones near the joint are more common in syphilis. Syphilitic Charcot joints are less common in the foot, which is the classic location in diabetes.

Clinically, the earliest change noted in diabetic patients is tarsal swelling with no fluid, heat or pain. This progresses to a thickened, flattened foot with eversion and external rotation.^{2,10} The disease is usually progressive but may become stationary if the neuropathy improves.¹⁸

A distinction should be made between the neuropathic type of arthritis and the more common (but less specific) type of foot disease seen in diabetes. In the latter, evidence of arterial insufficiency and infection are present and there is no apparent relation to presence of neuropathy or to duration of diabetes.¹¹

Pathological Findings

The process begins in the cartilage and in the zone of calcification between the cartilage and the underlying bone. Erosion of the cartilage, with invasion from the pannus by fibrous tissue are early changes. Fractures and marginal lipping occur. There may be extensive resorption of the ends of the bones. Exostoses develop, and extensive, disorderly new bone formation takes place. Joint "mice" are common. Bits of bone and cartilage are ground into the synovium, and the joint ligaments become lax. Ossification of the joint and periarticular structures may take place.^{1,2,6}

X-Ray Findings

The x-ray changes may be deduced from the foregoing. There is enlargement and extensive destruction of the joint with chaotic new bone formation.^{1,2}

Pathogenesis

It is not clear why joints should behave in this manner. Charcot's original publication evoked an immediate controversy between him and Volkmann, resulting in a "German school" and a "French school." Charcot contended that the lesions were due to loss of "trophic influences" from the nerves, while Volkmann and Virchow

maintained that they were mechanical and related to the unmitigated and unperceived traumata which such joints were exposed.

Evidence for the trophic theory is partly by analogy to the atrophy of denervated muscle. Denervated teeth also show some atrophy and more pertinently, sometimes a combination of atrophy and hypertrophy. In patients with nerve lesions occurring early in life, not only muscle but bones fail to develop normally. When the trigeminal nerve is sectioned trophic disturbances of the eye are troublesome, but if the section is made in the medulla behind the point where the sympathetic fibers join the fifth nerve trophic lesions do not occur. Trophic lesions are not generally seen after sympathetic section, however.¹²

It has been suggested that sympathetic innervation exerts its influence through vasomotor control. Some authors even refer to "neural nutrition" by analogy with blood supply to the joints.^{2,7} One of the strongest arguments for trophic influences is the clinical observation that these lesions occasionally develop with prodigious rapidity going on to complete joint destruction within a few weeks. This is thought to be inconsistent with the "repeated microtraumata" theory.

The identity of the trophic nerves is a problem in itself. There is no agreement as to whether they constitute an anatomic entity or a physiologic concept. They have been placed in the lateral horns of the dorsal cord and in the gelatinous substance of the lumbar cord. Others deny anatomic localization; some would equate them with autonomic nerves.

Gardner^{13,14} has made extensive studies of joint physiology and anatomy. He stated that the nerves are small and consequently the intra-articular distribution is uncertain. His studies were made largely in fetuses. He has confirmed the hypothesis that the joints are innervated by branches from trunks which supply the overlying skin and relevant muscles (Hilton's law). There is some overlap in supply, and most of the bundles run with vessels. Pacinian bodies are found around the joints but there is some difference of opinion as to whether or not they are in the joints. Free nerve endings are found in the capsule but not in the synovium.

He indicated his belief that the role of the nerves, apart from proprioception, pain and vasomotor control, is uncertain. He found no evidence for "trophic" function. He observed that the

inical conditions in which Charcot joints occur ways have accompanying nervous lesions of the in, bones, and muscles.

As a matter of fact, there is some evidence that nervation may afford some protection against a related hypertrophic lesion. Stecher and Karnosh¹⁵ made the interesting observation that Heberden's nodes do not develop in a palsied limb. They cited cases of unilateral cord disease, cerebral palsy and peripheral nerve lesions. They discarded the theory that this is due to protection from trauma, because they believe that heredity is the most important factor in the genesis of Heberden's nodes. They suggested that increased blood flow in the defectively innervated limb prevented the development of the nodes.

Experimentally it has been shown that cutting the posterior roots of cats' spinal cords causes Charcot joints in some but not all subjects. If a concomitant joint injury is inflicted, all develop the disease.¹²

The other school has stressed the mechanical etiology. It has been pointed out that a denervated joint has multiple deficiencies. Minor traumata are not perceived and consequently not treated (tested) or even avoided. The absence of proprioceptive sense means that stresses are applied with the joint in a disadvantageous position. In addition, the joint may move beyond its usual extreme positions both because of loss of proprioceptive sense and because of muscle and ligament laxation.^{12,16}

Casagrande and his associates¹⁶ stated that all these factors—loss of pain sense and of proprioception, faulty muscle co-ordination, and continued use of the joint—must be present for a Charcot joint to develop. They cited an interesting experience. They performed joint denervation on three patients with painful ankles. No Charcot changes developed despite continued activity. The authors concluded that normal muscle co-ordination protected these patients.

At the same time these lesions do occur in other situations where not all of these factors are present. The occurrence of Charcot changes in poliomyelitis has already been mentioned. Here muscle tone, which stabilizes and protects the joint, would be decreased. In syringomyelia, on the other hand, the important loss would be that of pain sense; proprioception may be intact.

It is generally true that Charcot joints do not occur in a limb which is maintained at rest, and

this certainly bespeaks an important role for "wear and tear." There are exceptions, however; the changes have been seen in a bed-ridden patient.^{12,17}

Petrie³ reported the interesting case of a twenty-two-year-old woman with congenital indifference to pain. Charcot changes developed in both knees, one hip and the spine. The patient did not have anesthesia. She could perceive and properly identify a pin prick, and her temperature sense was intact. She simply failed to distinguish unpleasant stimuli. Here, proprioceptive sensation and joint support by muscles were present, and the patient must have been aware of jarring and stretching traumata to the joints. It is particularly difficult to see how ordinary activity could have caused serious trauma to the spine which is a securely guarded structure. It is of interest that a spinal fusion was successful in this case. Fusions often fail in Charcot joints due to the usual causes. A study¹⁷ of biopsy material from this patient revealed normal free nerve endings in the skin and periosteum.

A similar case⁴ was reported in a two-year-old child. As he grew older, however, partial pain sense developed; concomitantly his affected ankle showed marked improvement.

In summary, it would appear that combinations of the following are important for the development of neuropathic arthropathy: loss of proprioceptive sense, loss of muscle guarding and co-ordination, loss of pain sense, continued wear, and poorly understood metabolic derangements consequent to interruption of various nervous modalities.

Treatment

Treatment is aimed at prevention of further damage and preservation of weight-bearing function. This is usually accomplished with external braces. Fusion, while desirable, can seldom be accomplished. In one series²¹ the author reported failure of attempted fusion in ten of twelve knees and in all of three hips. Internal fixation has occasionally been satisfactory. Occasionally amputation is necessary and poor stump healing may be a problem.

Treatment of lues and diabetes does not affect the joint problem, although it has been stated that when diabetic neuropathy improves the joints cease to deteriorate.^{10,18}

Improvement following sympathectomy in two cases has been reported,¹⁹ which the authors

attributed to improvement in blood supply. The published x-rays were unconvincing, however, and vascular changes are not generally considered an important factor in this disease. In another case report,²⁰ no improvement was noted following this procedure in a middle-aged diabetic woman. No evidence of circulatory insufficiency was present.

Summary

A peculiar arthropathy, characterized pathologically by degeneration and hypertrophy, and clinically by swelling, crepitation, instability, and painlessness, is found in a variety of nervous affections. The pathogenesis is discussed.

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SMOKING IN ASTHMA AND EMPHYSEMA

(Continued from Page 116)

reasons for cough. The condition of any patient with asthma who continues to smoke will become gradually worse over the months and years; conversely, the patient with asthma who stops smoking can be certain of considerable symptomatic relief.

The patient who has emphysema complicating asthmatic bronchitis has a similar problem, but the irreversible changes in the lungs in this condition will not be helped by cessation of smoking. However, such patients usually have a considerable degree of bronchitis, which is aggravated by smoking tobacco. Stopping the smoking reduces the cough and bronchitis. Without coughing and bronchial irritation, the emphysema may not progress. A number of authors⁵⁻⁷ recently have stressed the relationship of emphysema and smoking but remarkably little about this subject has been mentioned in medical textbooks.

Without exception, patients who have asthma or

emphysema should not smoke anything in any amount at any time.

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Clinical-Pathological Conference

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CASE PRESENTATION

MINNEAPOLIS VETERANS HOSPITAL

SAMUEL NESBITT, M.D., Moderator

REUBEN BERMAN, M.D., Discussion Leader

First Admission (June, 1949).—A twenty-four-year-old white man entered the hospital for excision of a bilonidal cyst. A photofluorogram was interpreted as showing an enlarged cardiac silhouette of left ventricular type, but this was not apparent on the six-foot films. He presented no signs or symptoms of heart disease. The family history was negative, as was the patient's past history. The electrocardiogram was normal.

Second Admission (February, 1954).—He complained of dyspnea and a feeling of substernal pressure on exertion for two or three weeks and a slightly productive cough; there were no chills or fever. His private physician had given him two injections of penicillin. About one or two months previously, he had experienced an episode characterized by diarrhea, malaise and headache for one week.

The temperature was 99.4° F., the pulse rate 76 beats per minute and the blood pressure 120/80. Fine rales were heard over the right lateral lower part of the thorax. The cardiac apex was 11 cm. from the midsternal line. An early, high-pitched, grade 2 diastolic murmur was heard at the left sternal border. A third heart sound was also audible. The circulation time (arm to tongue) was 17 seconds, and the venous pressure was 22 cm. of saline.

Urinalysis was negative. The hemoglobin was 15 gm. per 100 ml. of blood, the leukocyte count ranged from 11,900 to 5,900 per cubic millimeter of blood, with a normal differential count and the erythrocytic sedimentation rate varied from 38 to 23 mm. per hour. Three blood cultures were negative. Brucella agglutinins were absent. The antistreptolysin titer was 500 units. Cardiac fluoroscopy showed a greatly enlarged heart, primarily of the left ventricular type, with some questionable right ventricular enlargement. The electrocardiogram showed low voltage, left axis deviation, nodal extrasystoles and nonspecific changes in the ST and T waves.

He was kept at rest in bed and was given a low-sodium diet and digitalis. Repeated electrocardiograms showed first and second-degree AV block. Use of digitalis was discontinued, and salicylates and penicillin were administered orally. In April, an apical, grade 2 presystolic murmur was heard. The antistreptolysin titer decreased to 50 units and the sedimentation rate became normal. He frequently showed afternoon temperatures of 100° F. and occasionally complained of dull precordial pain. Thoracic roentgenograms showed

decrease in size of the heart. He was dismissed after five months to continue oral use of penicillin at home.

Third Admission (October, 1954).—For one week he had had chills and fever, dyspnea and a cough that produced pink frothy material. His doctor had administered an oral preparation of penicillin, erythromycin, salicylates and cortisone.

He appeared acutely ill. The temperature was 99.8° F., the pulse rate 100 and the blood pressure 120/60. Fine rales were heard over the lung bases. The point of maximal impulse was in the sixth interspace at the anterior axillary line. The pulmonic second sound was loud and duplicated. A grade 1 blowing diastolic murmur was heard along the left sternal border and a grade 1 rumbling diastolic murmur at the apex. Minimal ankle edema was present.

Urinalysis showed 1+ albumin and 1+ sugar, two to four leukocytes and occasional erythrocytes and hyaline casts per high-power field. The hemoglobin was 10.9 gm. and the leukocyte count was 18,750 (80 per cent neutrophils, 16 per cent lymphocytes and 4 per cent monocytes); the sedimentation rate was 110 mm. The antistreptolysin titer was 625 units, and the C-reactive protein was 4+. The electrocardiogram showed a wandering pacemaker, premature ventricular contraction, second-degree AV block, and changes in the ST and T waves. Thoracic roentgenograms showed increase in heart size and changes consistent with pulmonary edema.

He received blood, penicillin, cortisone and digitoxin. The temperature remained normal except for an occasional afternoon rise to 99° F. In about two months, the sedimentation rate was normal and the antistreptolysin titer was 250 units. Within three months, the C-reactive protein was negative. Use of cortisone was discontinued and he was dismissed after four months in an improved state.

Final Admission (May 10, 1955).—Soon after dismissal, he noted epigastric pain associated with nausea, vomiting and diarrhea, which persisted. He appeared acutely ill. The temperature was 100° F., the pulse rate 80 and the blood pressure 110/80. Moist rales were heard over the lung bases. Examination of the heart was as previously described. There was minimal ascites and a tender liver edge was felt four fingerbreadths below the costal margin. The spleen was not palpable. There was no peripheral edema.

Urinalysis revealed albumin 3+, five to seven leukocytes, one to two erythrocytes and occasional coarse granular casts per high-power field. The hemoglobin was 13.1 gm. and the leukocyte count was 10,400, with a normal differential count; the sedimentation rate was 35 mm. The serum amylase was 58 units. Stools were negative for occult blood. The antistreptolysin titer was 333 units. Five aerobic and anaerobic blood cultures were negative. The thoracic roentgenogram showed further increase in heart size. Roentgenologic studies of the abdomen and upper part of the gastro-

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intestinal tract showed no abnormalities. The electrocardiogram disclosed first-degree heart block, occasional ventricular premature contractions, low voltage, and left ventricular strain or digitalis effect or both.

Thorazine was administered and use of digitoxin was discontinued for three days, after which his complaints subsided. On the fifteenth day, he complained of generalized abdominal pain that became localized in the right lower quadrant, where muscle spasm and rebound tenderness were noted. The leukocyte count was 13,000. Appendectomy was done with the patient under local anesthesia. The pathologist's report was subsiding appendicitis. Ascitic fluid (800 ml.) removed at operation showed a specific gravity of 1.020 and a value for protein of 3.7 gm. per 100 ml. This fluid contained four leukocytes and 4,160 erythrocytes per cubic millimeter. Culture was negative.

Immediately after operation, the blood pressure decreased and the patient required levophed and aramine for two days. He became oliguric and remained so. Three weeks following operation, the blood urea nitrogen was 17 mg. per 100 ml. and the carbon dioxide was 18.9 mEq. per liter; values for chloride, sodium and potassium were 91, 123.4 and 7.4 mEq. per liter, respectively. Jaundice was observed and the serum bilirubin was found to be 1.1 mg. per 100 ml. at one minute, with a total of 3.5 mg.; the cephaline flocculation was 2+ and 3+, the thymol turbidity was 2.8 units and the alkaline phosphatase was 11 King-Armstrong units. Peripheral edema was noted, as well as reaccumulation of ascitic fluid. His condition deteriorated steadily and he died thirty-four days after operation.

Discussion

DR. REUBEN BERMAN: A common alibi raised at these conferences by the discussor is that he would have done so much better had he seen the patient. I am told that I did see this patient, so my alibi is destroyed; however, I do not remember him.

In 1954, the patient had an illness characterized by prodromal symptoms of diarrhea, malaise and headache, followed soon by dyspnea, fever, an enlarged heart and rales at the right base. At the onset of these cardiac findings, he had a high-pitched, grade 2 diastolic murmur, normal circulation time and increased venous pressure. The urine was normal. The sedimentation rate, antistreptolysin titer and C-reactive protein were increased. Perhaps at this point we ought to see the roentgenograms.

RADIOLOGIST: The first films are dated December, 1954, and were taken during the third admission. There is definite cardiac enlargement, with predominance of the left side of the heart and only mild left atrial enlargement. In May, 1955, the heart had enlarged further and again the enlargement is about the same configuration. It would not be possible to rule out pericardial effusion. In June, 1955, the picture is the same. As far as the heart silhouette goes, the radiologist would consider either a mitral lesion, combined with either myocarditis or pericardial effusion, or possibly mitral stenosis and aortic stenosis, which are less likely.

DR. BERMAN: A presystolic murmur was heard later in his illness. The antistreptolysin titer decreased and the sedimentation rate became normal. I assume that a diagnosis was made of acute rheumatic fever with defects of the aortic and mitral valves. He apparently improved during the summer. He came in again

obviously in cardiac decompensation. The same diastolic murmur was heard at the base and a rumbling diastolic murmur was present at the apex. Now he had an abnormal urine, with 1+ albuminuria that could represent the albuminuria associated with heart failure.

Here is a person who apparently was well until the spring of 1954, when he acquired an illness characterized by acute prodromal symptoms of malaise and diarrhea. He came into the hospital with a large heart and some murmurs. The heart got a little bigger and then smaller; again it enlarged and was associated with a high sedimentation rate and increases in C-reactive protein and antistreptolysin titer. He had a diastolic murmur heard first over the base, suggesting aortic insufficiency, and later at the apex, suggesting mitral stenosis. The indications are overwhelming that this man had acute rheumatic fever associated with endocarditis manifested by these two valvular lesions. The surprising thing was the fact that, with normal blood pressure and only a faint diastolic murmur, the man was in heart failure. He was extremely sick and yet had minimal valvular lesions. Subacute bacterial endocarditis with attendant anemia and toxemia occasionally will cause an otherwise compensated heart to decompensate. We have no evidence in this case that endocarditis was present. More likely this man continued to have acute rheumatic fever, with rheumatic myocarditis and, in all probability, pericarditis—in other words, rheumatic pancarditis. The main reason that his heart failed was myocarditis, the effect of the valvular lesions being minimal.

The final admission is most interesting because he came in with findings suggestive of acute surgical abdominal disease. He also had an enlarged liver, which he did not have before. The antistreptolysin titer again increased. This is the first time I have thought I could get some value out of the antistreptolysin titer and C-reactive protein. He was given Thorazine and had some jaundice afterward. A diagnosis of acute appendicitis apparently was made and appendectomy was done. The findings were ascitic fluid with a high specific gravity, a large number of erythrocytes and a negative culture. His blood pressure decreased after the operation and he became oliguric. He had a normal blood urea, decreased carbon dioxide, chlorides and sodium, and increased potassium.

I am interested in the shock associated with low chloride and high potassium values. I am wondering if this man had an adrenal crisis. My diagnosis is rheumatic fever with pancarditis, especially myocarditis, and slight mitral stenosis and aortic insufficiency. The terminal event was recurrence of rheumatic fever with rheumatic peritonitis.

DR. FLINK: The increased potassium could be explained by heart failure alone, with a low pulse syndrome. We have seen examples of this, the most frightening of which involved a man with tuberculous pericarditis who had a striking electrolytic pattern suggesting adrenal insufficiency. His potassium was even greater than in this case and his sodium was about the same.

DR. SMITH: I would like to ask if the internists find any comfort in the pathologist's report of subacute appendicitis.

DR. BERMAN: Subacute appendicitis does not mean anything in the face of the ascites and the exudative character of the fluid.

DR. GLEASON: That diagnosis should have read probable minimal subsiding appendicitis.

DR. SMITH: If one of us were presented again with a case similar to this, what would we feel would be the minimal requirements for laparotomy?

DR. BERMAN: In the face of all the other medical problems, I would be loath to recommend appendectomy, regardless of the findings.

DR. HALL: Some things about this case are peculiar if you are going to call it rheumatic fever. The onset was rather strange. Rheumatic fever seldom starts with diarrhea; it more often starts with a sore throat. Furthermore, in all these episodes we heard nothing about any joint pains or signs of joint inflammation. In the third admission it was stated that he had chills and fever; it is indeed unusual to have shaking chills in rheumatic fever in spite of the fact that the patient may be febrile. This man undoubtedly had some form of myocarditis and, if we are to believe the report that he had these diastolic murmurs, I suppose we have to presume that it was rheumatic but I think it is a strange case of rheumatic fever.

DR. SMITH: I would like to ask Dr. Hall if the antistreptolysin titer would be compatible with other possibilities than rheumatic myocarditis. Given myocarditis and these antistreptolysin titers, what other possibility would you consider?

DR. HALL: These titers certainly support strongly the diagnosis of rheumatic fever but they are not entirely specific. The antistreptolysin titer increases in any kind of streptococcal disease, as well as in many other conditions, so this test certainly is not specific for rheumatic fever.

QUESTION FROM AUDIENCE: How frequently does 3+ albuminuria result from cardiac failure alone?

DR. BERMAN: It is very common.

Discussor's Diagnosis: 1. Rheumatic pancarditis, with valvulitis, mild mitral stenosis, mild aortic insufficiency, myocarditis and probable pericarditis; 2. Probable rheumatic peritonitis.

Ward Physicians' Diagnoses: 1. Rheumatic pancarditis, as above; 2. Possible viral myocarditis.

Pathologic Aspects

DR. GLEASON: Necropsy disclosed 2+ edema of the lower extremities and five liters of dark but clear yellow fluid in the abdomen. About 100 ml. of similar fluid was present in each pleural cavity, with no unusual

amount in the pericardial cavity. The pericardial surfaces were smooth and glistening.

The heart weighed 550 gm.; the muscle of all four chambers appeared to be hypertrophied. The inferior vena cava, superior vena cava and pulmonary veins were definitely dilated. All the cardiac valves were practically normal. One aortic valve had slight thickening at the edge of one leaflet. There was no evidence of stenosis nor insufficiency. One mitral valve had a small, thin, flat plaque about 1 cm. in diameter on the broad part of the leaflet. There were no verrucae to suggest rheumatic disease. The chordae tendineae were not thickened. The myocardium was paler and a little softer than normal. The coronary arteries showed minimal atherosclerosis.

The lungs were only slightly increased in weight. The liver was normal in weight but was markedly "nutmeg" in character. The right kidney weighed 200 gm. and the left weighed 225 gm. The right kidney contained several infarcts that were pale and beginning to shrink; they probably corresponded closely in age to the time of the acute abdominal episode. One of them was in the anterior aspect of the lower pole and could well have accounted for the entire episode. The gastrointestinal tract was entirely normal. The aorta showed minimal atherosclerosis. One small mural thrombus was present in the left iliac vein just as it entered the vena cava.

Microscopically, the only striking change in this case was in the myocardium, in which there was diffuse fibrosis between the myocardial fibers (Fig. 1). This fibrosis was present in all portions of the heart. There were practically no leukocytes to be seen, so it was not an exudative process. It was a simple bland fibrosis occurring uniformly between muscle fibers and not concentrated around small arteries, as would be expected in rheumatic lesions.

The microscopic appearance raised many possibilities. Azocarmine stain showed that practically all the tissue between the fibers was collagen. A slight concentration of connective tissue was noted beneath the endocardium but nothing even approaching what has been referred to as "subendocardial fibro-elastosis"; in addition, special stains showed no elastic component in the diffuse scarring. Stains for amyloid likewise were negative.

The rest of the pathologic changes were incidental to the congestive heart failure or unrelated to the basic disease. There was severe central atrophy of the liver, enough to account for the jaundice and the abnormalities in liver-function tests. Sections of the lung showed some pulmonary congestion and early bronchopneumonia. The lungs did not contain many "heart-failure cells." The kidney infarcts were fairly old. There were no mural thrombi in the heart to account for these; it is possible that they came from thrombi in pulmonary veins.

Nothing about this case from the pathologic aspect really bears any resemblance to rheumatic fever. Valvular changes were minimal. Pericarditis was absent. Aschoff nodules were absent and the myocardial scars were not perivascular. None of the other stigmata of rheumatic fever were present. Stains for amyloid were

negative and the process did not look like amyloid. It was fibrillar. It was not an exudative process like Fiedler's myocarditis or any of the other myocarditides. Leukocytes were absent in the sections. The possibility

ported on copper deficiency in cattle and these cattle have interstitial cardiac fibrosis. Severe hyperthyroidism and hypothyroidism have been associated with some interstitial myocardial fibrosis of the myocardium. This



Fig. 1.

was raised that it could be healed exudative myocarditis, but it would have to be completely healed and it is difficult to believe that exudative myocarditis of this extent, as evidenced by the scar that was left, would have permitted the patient to survive. Exudative myocarditis often shows scanty inflammatory infiltrate and yet prove fatal.

One possibility in this case is scleroderma. The heart involved in scleroderma looks like this but it would be impossible to prove a case of isolated scleroderma of the heart. It is also possible that this is actually some kind of congenital process. Dr. Bell favors this concept, in the sense that the mesenchyme in which the heart originated did not differentiate completely into muscle and this residual tissue eventually compromised the function of the heart. This is an interesting idea because, about the same time this case was being reviewed, autopsy material was received from another VA Hospital in a case in which a clinical diagnosis of Fiedler's myocarditis had been made. That heart showed the same changes as in this case. The man was twenty-six years of age and had had idiopathic heart failure for about nine months before he died. His sister is now suffering from idiopathic heart failure, he had a brother who died at age twenty of heart trouble of unknown type and his mother died at about age thirty of heart trouble of unknown type.

Animal work suggests that interstitial fibrosis eventually occurs in vitamin B₁ deficiency. The few beriberi hearts that Dr. Bell has seen showed a little edema between the fibers but certainly nothing like the changes in this case. Australian veterinarians have re-

ported on copper deficiency in cattle and these cattle have interstitial cardiac fibrosis. Severe hyperthyroidism and hypothyroidism have been associated with some interstitial myocardial fibrosis of the myocardium. This patient had no signs of thyroid disease and his thyroid was normal at autopsy. Exposure to x-rays in animals has produced interstitial fibrosis that resembles this somewhat. Long-standing acromegaly sometimes is associated with interstitial myocardial fibrosis. Experimentally, various drugs such as digitalis given to excess and adrenalin given over long periods have resulted in some interstitial fibrosis. However, none of these factors seem to apply in the present case.

Final Anatomic Diagnoses: 1. Idiopathic, diffuse, interstitial myocardial fibrosis; 2. Chronic passive congestion of liver; 3. Infarcts of right kidney.

DR. SMITH: I would like to comment on the murmurs. This man undoubtedly had aortic insufficiency but I do not know the genesis of the insufficiency. It conceivably could be due to an enlarged aortic root from the general dilatation. I would like to know Dr. Gleason's opinion of the pathogenesis of this process. Do you think that the myocardium became collagenous without going through a stage of some myocardial necrosis or do you feel that the myocardium ever was involved?

DR. GLEASON: Study of field after field of the sections, which all look the same, shows that muscle fibers are not missing. It does not appear that muscle fibers became necrotic and were replaced by scar. It does appear that the connective tissue arose slowly around the fibers or at least was there for an extremely long time.

Editorials

JOHN F. BRIGGS, M.D.
ARTHUR H. WELLS, M.D.
HENRY G. MOEHRING, M.D.

MEDICINE'S CONTRIBUTION TO WORLD PEACE

Medicine is universally recognized as one of the great world-wide arts and sciences that bind humanity together with a language and a purpose transcending all differences of race, creed, or color.

To make the language of medicine more articulate in the cause of international peace and human progress, the doctors of the free world are united in the World Medical Association, the membership of which now embraces fifty-three national medical societies.

But it is never enough to establish great institutions. Only when individuals are given an opportunity to play an active part does any human organization come alive and begin to realize its basic purposes.

Every American doctor knows first hand the vital role he may play in guarding and protecting his profession by becoming an active member in his county, state, and national medical society.

Today, every American doctor has the opportunity and the imperative challenge to help make his profession a stronger influence for world peace. This he may do by joining our own United States Committee of the World Medical Association.

Similar supporting committees have been organized in a number of other leading nations, whose national medical societies, like the AMA, are members of the World Medical Association.

In a timely action, the World Medical Association at its Tenth General Assembly in Havana in October adopted a six-point program to implement some of its constitutional purposes: to promote world peace. This program includes a development of mutual exchange visits of foreign doctors; exchanges of distinguished medical teachers; establishment by each World Medical Association member (national association) of an International Visitors' Bureau; stimulation of visits by representatives of member associations to the annual meetings of other member associations; holiday exchange programs between doctors and their families; and exchanges of textbooks and medical and scientific publications.

To implement this program takes money and interested members. You may play your part by

joining the United States Committee of the World Medical Association. Active membership dues for 1957 are \$10.00. This membership also makes you the recipient of the medical journal published by the World Medical Association. This is a monthly publication and contains, not only scientific articles, but news of medical progress on a world-wide basis.

Every member of our State Medical Association is urged to do his part in the promotion of world-wide peace and human understanding by joining the World Medical Association. Contact your county medical society officers or the state office for membership applications.

A. O. S.

THE PSYCHIATRIC SOCIAL WORKER IN PSYCHOSOMATIC MEDICINE

In a previous editorial it was noted that certain patients with somatic symptoms benefit from the treatment approach of the psychiatric social worker functioning in a clinic setting. This was true of a patient for whom a psychiatric social worker, in consultation with the psychiatrist, assumed major responsibility for treatment.

The patient's presenting somatic and almost disabling symptoms of suffocation, chest pains and near black-outs had precipitated a severe anxiety state. The diagnostic conclusions, formulated by the clinic team, accurately assessed the advisability of assigning this patient to a psychiatric social worker. The factors particularly important in reaching such a decision were: (1) The patient, who readily engaged himself in the therapeutic relationship, manifested from the beginning a desire to focus on what could be so disturbing to him in his environment. (2) Personality disintegration did not have to be dealt with as the patient had not yet created any serious problems in his work and family situation. (3) The patient in his initial relationships with the clinic demonstrated a desire to better understand himself, but rejected a plan of treatment by the psychiatrist with whom the primary focus of treatment would have been on the resolution of inner conflicts.

The patient rapidly developed a healthy secure feeling within the socio-psychiatric oriented therapy of the psychiatric social worker. He was

then able concurrently to utilize drug therapy under direct supervision of the psychiatrist for alleviation of the near-panic anxiety state. Following this, the patient could deal openly and intensively with the meaningful factors in his family and work experiences. This temporarily became a real hurdle for this patient as the therapeutic process revealed that his personal and work life had been, and continued to be, successful and satisfying. However, the focus in treatment on the reality situation and environment remained constant, and the seeming hurdle offered the opportunity for the inclusion of the patient's wife in the therapeutic experience. Traditionally, the psychiatric social worker is skilled in working with family members and also in clearly maintaining her objective in working with them—which is to facilitate treatment of the patient. In the case of this patient, several interviews with his wife resulted in providing the first real clue to causation in the patient's disorder. Several weeks had to elapse before the patient was ready to deal with the knowledge the therapist possessed. It was at this time that the psychiatric social worker's knowledge of dynamics and the constant availability of psychiatric consultation were particularly important. The patient had to be helped to look superficially but sufficiently at what, in his present situation, was reactivating the repressed painful feelings of earlier life experiences. He also had to be helped to recognize such feelings were now being expressed with such severe physical symptoms. During this period of treatment the wisdom of having this patient seen by a psychiatric social worker was repeatedly manifested, for the patient would have turned the focus of treatment "inward" more than "outward" because of a temporary focus on inner conflict. More than a temporary focus "inward" could have precipitated some personality disintegration and thereby damaged some of this patient's emotional health. Since the psychiatric social worker's orientation is "outward," this danger was averted.

With the maintaining of the appropriate focus in treatment this patient was helped to give up his almost disabling somatic symptoms and modify his behavior so he could make the most productive use of his personal and environmental resources.

ROSABELLE SNOHR

*Psychiatric Social Worker
Hamm Memorial Psychiatric Clinic*

CURRICULUM OF THE MEDICAL SCHOOL

At the present time the Medical Student Committee at the University of Minnesota is studying the curricula of several other medical schools throughout this country. An attempt has been made to select the so-called best schools in the country and a few other schools which are outstanding for various reasons. So far, this has been entirely a student project except that the opinion of the faculty was sought to help select schools.

The original purpose of the survey was twofold: First, to compare time spent at this school with time spent at other schools in an effort to evaluate critically the need for the summer session at Minnesota; second, to study other schools purely because of interest in medical education.

The survey is still at a very immature stage. It is mentioned here solely for one purpose, namely to indicate the interest that medical students feel in the curriculum. We feel that by the time a medical student has finished his course he knows the curriculum better than anyone, including faculty members who mapped it out on paper. Admittedly, the student does not know what should be taught as well as a faculty member might, but that is not the point. The point simply is that the student should be better able to estimate wasted time. By wasted time we mean excessive repetition of material from course to course between departments. We think that departments which do not make use of the time allotted to them, e.g., lecturers who fail to show up to give the lecture, are also wasting time.

Repetition and wasted time do occur. We think that they occur here at Minnesota, not excessively but often enough so that we feel that some of the time spent in summer sessions could be eliminated. Summer sessions have long been a tender subject to medical students at Minnesota. Income lost by having to attend school during the summer is often a real source of financial embarrassment. The student here further criticizes the present program because the free periods which were set for Tuesday and Thursday afternoons when the summer session was instigated are not observed by many departments.

The Medical Student Committee has been concerned with the summer sessions since its inception.

This is the fourth in a series of editorials concerning the medical student.

on. We hope to obtain some convincing evidence that the summer session at its present length is dispensable in at least one of the years in medical school.

RALPH B. SWANSON

University of Minnesota Medical School

ON CHARITY DRIVES

How long has it been since you last voiced a complaint on the number of charity drives one encounters in the course of a year's time? Perhaps it was last month when you received your Christmas Seals in the mail. Maybe it was yesterday when a solicitor called on you for the March of Dimes. Or it could be as long ago as that week last fall when you were "hit up" for a contribution to the YMCA, Sister Kenny fund, Salvation Army and Boy Scouts—all in one week. There is the possibility you are one of those unusual citizens who truly finds joy in giving and helping others. We hope so.

But if you aren't, perhaps the argument that you have been "over-burdened" deserves some analysis. After all, there's no sense in nursing a grudge; a person might as well decide whether he wants to do his part gladly, or forget about charities altogether.

Is society really "overburdened" with charity drives? Check the following list and see if your answer gives a key:

Have you ever been able to claim more than the 10 per cent automatic deduction for charity on your federal income tax? (Federal tax authorities say that very few ever do.)

Have you ever had to forego purchasing something you wanted or needed badly because you have the money to a charity? (We'll bet you haven't.)

Have you or your family, or a friend or a relative ever benefited substantially from a charity? (Be careful before you say "no" to this one. Just think of the progress in fighting disease and human hardship which has been accomplished by the nation's charitable organizations.)

Would you truly prefer that there be no charity drives so society could return to the Dark Ages when tuberculosis and polio were rampant, youth recreational needs were ignored, severe suffering due to poverty was commonplace and no one came to the rescue when disaster struck? (We doubt it.)

Do you believe these vast charitable enterprises should be taken over by the government?

This appears to be the only alternative, and we hardly believe the government could do the same job as cheaply and as well.

Think of these questions the next time someone calls on you for a contribution. It may make it easier for you to "do your part"—with a smile instead of a grimace. And it may make you feel a lot better inside, knowing that your small gift will never be missed, and together with the gifts of millions of others, will really amount to something worthwhile.

—Reprinted from the *Worthington Daily Globe*, January 19, 1955

LIGHTING THE DOCTOR'S OFFICE

Perhaps in few professions is the dependence on sight as vital as in the medical profession. When one considers that sight and light go hand-in-hand, one equally dependent on the other, the realization of the importance of good lighting to the field of medicine becomes increasingly apparent.

In addition to its functional importance in both examination and treatment, the psychologic effect of lighting on the patient should not be overlooked. The professional man who gives serious thought to proper lighting in his office adds substantially to his chances of success. Increased office efficiency and more attractive surroundings to his patients are contributing factors.

Since several areas in the average doctor's office are used for quite different purposes, distinctly different lighting techniques should be employed. In some cases, they are primarily decorative and in others utilitarian, depending on the function of the room.

Although a doctor's office may be in a commercial office building or his home, in a separate dwelling or an apartment house, it will have little bearing upon the lighting methods recommended for various rooms and work areas.

Reception Room—A patient's first contact with the office is the reception or waiting room and it should be planned with his comfort in mind . . . free of all aspects of the medical profession. Whether there is a nurse-receptionist present or not, a friendly reassuring atmosphere will do much to calm "waiting room nerves." Much can be done with the room's decor, but well-planned lighting plays an important role too.

Floor and table lamps properly placed help create a homelike atmosphere. Their very familiarity subconsciously helps to reassure the nervous patient. Fluorescent ceiling fixtures alone might provide higher light levels at less cost, but the effect, physically and psychologically, might be professional and cold.

Magazine reading is a favorite pastime among patients waiting for appointments. Reading lamps should provide plenty of light without the discomfort of eyestrain. Any bright source of light which comes into the line of vision can be most annoying, especially to those just sitting. For this reason, all lamps should be equipped with white translucent bowls to diffuse the light source. In addition, attractive transparent shades should be added for a more pleasing decorative effect. White is best for illumination.

For reading, 100 watts are recommended with a six-inch bowl and 150 watts for an eight-inch bowl. If it is a three-way switch, 50-100-150 watts are favored. Floor lamps require 100-200-300 watts in a three-way light.

D. P. CAVERLY

Sylvania Electric Products, Inc.

MINNESOTA HUMAN GENETIC LEAGUE

By authorization of the Board of Regents of the University of Minnesota, the Charles Fremont Dight Institute for the Promotion of Human Genetics began to function on July 1, 1941, under the supervision of a director, Professor C. P. Oliver, and an advisory committee. Theodore C. Blegen, Dean of the Graduate School, has served as chairman of the Advisory Committee during the fifteen years of its existence. Two other "charter members" of the committee are still serving faithfully, Dwight E. Minnich, Chairman of the Department of Zoology, and Donald G. Paterson, Professor of Psychology.

Under the vigorous direction of Professor Oliver, the program of teaching, research and public counseling and information was initiated promptly. The first bulletin of the Dight Institute contained a report by the director on the organization and aims of the Dight Institute and a biographic sketch of Dr. Dight by Dr. Evadene B. Swanson. This biographic gem has provided the facts about

Dr. Dight which the present writer has included in this account.

It was not until 1944 in the third bulletin of the Dight Institute that the following sentence appears, "The subcommittee on eugenics societies has been corresponding with various American eugenics societies and is preparing plans which we hope will interest a group in organizing a eugenics society in Minnesota." Outside assistance failed to materialize and it became clear that the precise type of organization which Dr. Dight had envisaged was not the answer to the need. The problems were not as simple, nor the solutions as easy, as Dr. Dight had thought. Attempts to provide legislation regulating the reproduction of the public were not likely to succeed until more research had been done both on methods for controlling reproduction and in the basic science of human genetics. Consequently, the immediate need was for basic research in human genetics and interpretation of the results to the medical profession and the general public. Obviously, the first person who needs to be informed of discoveries from related fields concerning reproduction and health is the physician. From him the patient meaning the public, should receive the proper instructions and information about genetic problems.

It was decided that a modern "research oriented" society would be established without ties with any other group. Public education would be devoted to the wider dissemination of knowledge concerning human genetics, eugenics, and population problems.

The organization was to be called the Minnesota Human Genetics League. The articles of incorporation were filed on October 26, 1945. The president was Dwight E. Minnich, the treasurer, Theodore C. Blegen, and the secretary, Clarence P. Oliver.

This time there was to be no lack of participation by prominent citizens generally to be found working for all good causes. Professor Minnich approached the late Miss Helen Bunn of St. Paul, Mrs. Dorothy Atkinson and Mrs. John Cowles Sr., of Minneapolis, with the request that they become patrons of the League. They not only agreed to do so but gave generously of their time and energy in the work of the League over the years. Miss Bunn left a gift of \$10,000 to the Dight Institute of the University as one of her three bequests for the public good. Physicians and other prominent citizens joined the new organiza-

This is the fourth in a series of editorials on the Minnesota Human Genetics League.

on and have given it steadfast support during its decade of growth.

No provision was made for a paid secretary, but a partial solution was found in the willingness of the director of the Dight Institute to accept this burdensome job. The new Society was launched, and it would seem that the pitfalls which led to the disintegration of the old one had been avoided.

SHELDON C. REED

The Dight Institute for Human Genetics

BELL SOLAR BATTERY

Each day the sun pours on the earth as much energy as is contained in all the reserves of coal, oil, natural gas and uranium—and yet man has been unable to put this power directly to use. However, a step has been made in this direction by means of a solar battery developed by the Bell Telephone Laboratories. It is the first successful device which can convert the sun's energy directly and efficiently into usable electricity.

A laboratory model of the Bell solar battery was first demonstrated to the public at a meeting of the National Academy of Sciences some two years ago. At that time, the battery achieved a six per cent efficiency in converting sunlight directly into electricity. This compared favorably with the efficiency of steam and gasoline engines, in contrast with other photoelectric devices which have never been rated higher than one per cent.

With improved techniques, scientists at the Bell Laboratories have been able to increase this efficiency substantially—from six per cent to eleven per cent. Nothing is consumed or destroyed in the energy conversion process and there are no moving parts, so the Bell solar battery should last indefinitely.

The solar battery uses strips of wafer-thin silicon about the size of common razor blades. These strips are extremely sensitive to light. They can be linked together electrically, and can deliver power from the sun at the rate of 50 watts per square yard of surface. The specially-prepared silicon is obtained originally from common sand, one of the world's most abundant materials. The battery, along with other silicon devices, resulted from a broad fundamental program at Bell Laboratories for studying silicon and its possible application in modern electronics.

This is the fourth in a series of articles on the telephone.

Although work is still in the experimental stage, actual use of the Bell solar battery in the telephone business is a strong possibility. Down in Americus, Georgia, a solar battery is being tried as a battery charger at amplifier stations along a rural telephone system. This system, using Bell-invented transistors, points to greatly increased service on rural telephone lines.

No one knows what other uses will be found for the solar battery, but there are indications that it may some day serve mankind in a variety of ways. One company is experimenting with a sun-powered traffic light using the Bell solar battery and a suitable power-storing device. And, an automobile manufacturer has developed miniature cars using the solar battery to supply power to batteries.

NORTHWESTERN BELL TELEPHONE COMPANY

CHANGING CONCEPTS IN THE TREATMENT OF TUBERCULOSIS

Principles of Rehabilitation and Vocational Training

One of the effects of modern therapy has been to make our patients intolerant of long-continued rest. This is both bad and good; bad, because every patient still requires an amount of rest dictated by the extent of disease and toxemia at diagnosis, and by the form of treatment applied; good, because far too many in the past have been so imbued with the necessity for rest, and more rest, that they have lost the will and capacity for work. Man does not live by bread alone, but he requires bread, and he will be morally and psychologically supported if his bread comes from his own labor and not from charity. He may exist in the static conditions outlined in advice on rest, good food and the wise use of leisure, but he will not live in them; moreover, such advice requires a sound economy, and a mind that is either bovine, or strictly controlled by a philosophy usually too hard to acquire for the man, in such circumstances, whose pleasure in life depends on his active accomplishments.

It follows that what is called occupational therapy should be replaced as soon as possible by therapeutic occupation. The forty years' experience of Papworth has proved that the patient is seldom able to make his living by the products of diversional therapy. Such therapy is preparatory;

This is the ninth in a series of articles on pulmonary tuberculosis.

it should never be an end in itself; this applies to the student as much as to the machine minder or the secretary. By and large, the patient fit to be up all day and to take one hour's exercise is fit to start sedentary occupation in the sheltered conditions of the factory or the office at three hours per day, provided he spends the rest of the day as outlined by his physician.

Subsidization is justified only for the patient so disabled that he cannot get the basic necessities of life by his own efforts. To supply it without attempts to assess work-potential is misplaced generosity; to continue it without regular reassessment is to invite fraudulent use of charity or of government aids.

A scheme which recognizes these dangers is found in grants-in-aid over a definite period, during which both work-potential and the physical response to sheltered work and continued treatment can be re-examined at regular intervals. Training should be progressive at the rate for the individual, both in hours of work and in successive branches of the new trade. It was from his experience of such progress among his colonists that Varrier Jones said that "work creates hope, and hope creates vitality."

During this progress a true categorization of patient-workers will emerge. Some will be found totally unfit for industrial conditions in either sheltered workshops or open industry; for them home-work with subsidization is a necessity. Some will show a capacity for sheltered work at a few hours work per day and will require such work near their homes in order to avoid the fatigue of travel in tiring conditions. Others will show they can work seven to eight hours a day in a Settlement; among these are many who remain infectious. The majority will, within two years of commencing work, regain full working capacity in open industry, and remain sputum-negative as a result of their continued active therapy on sanatorium lines during nonworking hours.

Such a sifting process is full of the unexpected. While, by the patient application of trial and error, it may disclose the sad loss of functional ability as out of proportion to the physical, it can also develop the moral fiber of a man who has accepted a grave physical disability, but is determined to overcome it.

RICHARD R. TRAIL, M.D.
London, England

BLUE SHIELD ACTS TO MEET NEW CHALLENGES

Ten years ago, forty-five struggling local Blue Shield Plans had a combined enrollment of less than 2 million people. Today, 73 Blue Shield Plans cover some 38 million; and if their present rate of growth is maintained, these Plans will pass the 40 million mark in enrollment during 1957.

Several factors have conspired in recent years to alter and complicate the basic problems of Blue Shield enrollment: For one thing, most of the windfall apples have fallen off the tree, and enrollment men are having to climb ever higher in the tree to fill their baskets. Most local "blue chip" industrial groups have long since been enrolled by Blue Shield or some other agency, and the remaining local prospects are predominantly small groups, the self employed and rural dwellers.

Another vital new factor has been introduced by the tremendous growth of new industrial giant resulting from corporate mergers, and the concomitant tendency of labor unions to negotiate welfare benefits on a national scale. These big corporations and unions are demanding nation-wide hospital and medical care programs, offering at least the same scope of benefits for their workers in all parts of the country.

Blue Shield is an association of strictly autonomous local Plans, having similar purposes, but offering a considerable variety of specific benefits. The Constitution of Blue Shield Medical Care Plans recognizes that "state and local medical care plans should be autonomous in their operations so that the needs, facilities, resources and practice of their respective areas can be given due consideration, but that the health and welfare of the public is advanced by the co-ordination . . . of methods, coverages, operations and actuarial data."

The Plans have sought, by voluntary agreement to co-ordinate their efforts and to develop a basic program which each local Plan may offer to its members of inter-Plan groups within their local Plan areas.

Without sacrificing an iota of local independence, more than three-fourths of the Plans have recently reached agreement on a standard scope of Blue Shield benefits, all or any of which each Plan will make available to any group of subscribers desiring this pattern of benefits. Nearly all the

(Continued on Page 140)

Medical-Legal Opinions

JULE M. HANNAFORD, Legal Counsel
Minnesota State Medical Association

OBTAINING CONSENT OF PATIENT FOR SURGERY

An operation may not be performed upon a patient without first obtaining the consent of the patient or of someone authorized to act on his behalf, *Mohr vs. Williams*, 95 Minn. 261. However, a consent is not always valid and will not, therefore, protect a physician in every case. For example, a consent may be invalid (1) because it authorizes an unlawful act, i.e., an abortion not medically necessary; (2) because it is given by a person who has no right to give consent, i.e., a person mentally incompetent; or (3) because it was obtained by misrepresentation or fraud, i.e., representation that an operation is necessary when such is not the case or that an operation will give greater relief than can reasonably be expected.

Moreover, consent will not protect a physician unless the operation is performed strictly within the limits of the consent given. Thus, consent is no defense if in the course of an authorized operation a physician performs a different or a supplementary operation which is not necessary to protect the patient's health or life.

There is no legal requirement that a patient's consent to be valid must be in writing. Consent may be implied, oral or written. An implied consent results when an adult of sound mind is fully informed by his physician as to an operation that is to be performed and then co-operates with his physician in bringing it about. It is under the legal concept of implied consent that a physician is permitted in an emergency to operate on a delirious or unconscious person. An implied consent, however, necessarily leaves open to question the exact extent of the consent and may be difficult to prove in case of controversy. A physician who operates in an emergency on the basis of an implied consent should realize that if litigation ensues he will have to prove that an immediate operation was necessary, that an express consent could not be obtained from the patient or someone authorized to consent for him without endangering his health or life and that the operation performed was only such as was necessary.

Oral consent is, of course, consent by word of mouth. Ordinarily it is supplemented by an implied consent resulting from the co-operation of the patient with the physician in the performance of the operation. An oral consent may, however, be difficult to prove and its terms may not be clear. A physician who operates on the basis of an oral consent should, where possible, have at least one disinterested witness present when the consent is given, to minimize problems of proof.

Written consents can obviate many of the problems in connection with implied and oral consents—particularly the problems of proving the fact of consent and the terms of the consent. However, written consents should not be regarded as a panacea for all problems of the physician. For example, if a physician or a hospital follows the practice of requiring written consents before an operation and if the physician or hospital decides in a particular case not to require a written consent but to rely upon an oral consent and if the patient should later deny that he had given his oral consent, a court would probably admit in evidence testimony showing the existence of such a practice and such testimony could then be considered by the jury as evidence supporting the patient's testimony that no oral consent had been given. This problem could be minimized if the policy of the physician or hospital were not to require written consents in every case but rather to require written consents in such cases as they deem appropriate.

As a result of the foregoing we are of the opinion that written consents are undoubtedly the safest method of procedure for both a physician and a hospital to follow. However, we are further of the opinion that neither a physician nor a hospital should adopt a policy that no operation may be performed without a written consent because of the unfavorable repercussions of such a policy in cases where written consents are not obtained through inadvertence or otherwise.

We have examined forms of written consents used by several hospitals. From our examination of these forms we are of the opinion that many of them leave much to be desired. For example, one form attempts to relieve the physician and the hospital from liability for malpractice. We doubt whether such a written consent, even if properly signed, would be held by a court to be binding. Another form authorizes "whatever operation may be necessary or advisable." It does not, however, state who is to determine whether the operation is necessary or advisable. We fear that if litigation arose with respect to such a form, a court would say that the question of whether the operation was necessary or advisable is one to be decided by the jury. We would, therefore, recommend that such form be revised so as to authorize whatever operation may, in the opinion of the physician or surgeon in charge, be necessary or advisable. Many of the forms authorize whatever anesthetics are necessary. We would also recommend that this phraseology be revised so as to make clear who is to determine what anesthetics are necessary.

President's Letter

MEDICARE

Although your immediate past president, Dr. R. H. Wilson, discussed "Dependent Medical Care" in his October and December letters, this problem seems important enough, now that the law is in effect, to warrant additional consideration of its origin and of the possible effects of the statute on the physicians of Minnesota.

Under the terms of this law, the wives and children of members of the uniformed services henceforward will be able to obtain medical care without financial obligation to themselves. The term "uniformed services" includes the Army, Navy, Air Force, Marines, Coast Guard, and the commissioned corps of both the United States Public Health Service and the Coast and Geodetic Survey. The arrangement by which this will be done is known as "Medicare." Certainly, it is of interest to the physicians of the State of Minnesota to know something about the background and chronologic developments of the Medicare program.

In December, 1954, the House of Delegates of the American Medical Association voted that "if it is to be the policy of the Government to provide medical care for dependents of Service personnel, the services of civilian physicians and hospitals should be used whenever possible, to be paid for at prevailing rates with provision for free choice of physicians."

On June 11, 1956, the House of Delegates of the American Medical Association adopted a resolution in which it was urged that all medical associations co-operate with the Department of Defense "in the provision of medical service to the dependents of Service men, utilizing such insurance, medical service, or health plan or plans as are encompassed by the law. A plan or program for any given geographical area should first be approved by the organized medical profession of that area." At the same time, the House of Delegates also directed the Board of Trustees "to initiate direct liaison with the Department of Defense and render all reasonable and effective aid and assistance to State and County medical societies toward implementation of the Act."

Next, a special task force to study the problem of the medical care of dependents of service men was set up by the Board of Trustees of the American Medical Association. This task force engaged in a series of conferences with the Department of Defense. On July 28 and 29, 1956, representatives of constituent medical associations were called into conference by the American Medical Association in Chicago for discussion of the Medicare program with representatives of the Department of Defense. The task force and its special Committee have maintained continuous contact with the appropriate committees of the uniformed services in an effort to promote the best possible implementation of the Dependents' Medical Care Act.

The North Central Conference, consisting of Minnesota, Wisconsin, Nebraska, Iowa, and North and South Dakota, met in St. Paul in special session with representatives of the Department of Defense on Saturday and Sunday, August 11 and 12, 1956. Representatives of Ohio, Arkansas and Washington also attended the Conference, and the representatives of those three states expressed wholehearted, unanimous support of and co-operation with members of the North Central Conference in the Dependents' Medical Care program.

It seems obvious that the program for the medical care of dependents of military people actually is but one facet of a large and acute personal problem which vitally affects the security and financial well-being of the United States. In fact, civilian medical care for dependents who do not have access to military hospitals

is but one of a number of steps taken to increase the appeal for medical care for the military and dependents. And so, at the regular annual meeting of the North Central Medical Conference on Sunday, November 11, 1956, the Conference resolved "that the North Central Medical Conference recommends to the delegates and trustees of the American Medical Association that they continue to urge upon legislative bodies and the Department of Defense the great advantage of an additional allotment to the service man for the purpose of paying for the medical care of his dependents as a course which will improve the service man's morale and make more attractive to him a permanent career with the armed forces." It was felt that this allotment plan might remove the necessity for drafting civilian physicians into the armed forces for the purpose of providing medical care for the dependents of service personnel.

Minnesota and the other north central states immediately undertook active planning for the program for medical care. As a result, Mr. R. R. Rosell, our executive secretary, and Mr. Jules Hannaford, our legal counsel, went to Washington to negotiate a contract for the performance of various medical and surgical procedures employed in the practice of medicine. Thus, as in many previous endeavors of which the objectives were improvement of the health of our people, Minnesota medicine again has been in the forefront of this large and important undertaking.

The Council of the Minnesota State Medical Association has reviewed and revised the program in some areas. Finally, the contract was signed by the Department of Defense and duly appointed representatives of Minnesota medicine, and physicians of the State of Minnesota by law are now required to minister to the wives and children of men in uniform on a fee-for-service basis.

An advisory committee of Minnesota physicians will assist the executive secretary, Mr. Rosell, in trying to prevent inequities in the payment of fees and in adjudicating any misunderstandings and misconceptions arising from the practical operation of this program.

Hence, the burden of making this plan succeed rests upon the physicians of Minnesota and the people generally. Professional charges must be fair and in agreement with prevailing charges for a given procedure, in a given geographic region.

Let no one be misled by the thought that Medicare is a "final plan." Changes in it can be made at will by the Federal Government, and by the Department of Defense in particular.

Any physician who cares for patients eligible for Medicare should remember:

1. Medicare is intended to provide *full payment* for all services covered.
2. Medicare does not apply to normal outpatient care, with these exceptions:
 - (a) The cost of examinations that lead to immediate hospital care is covered up to \$75.00.
 - (b) The cost of treatment required after accidents is covered from \$15.00 to \$90.00. The first \$15.00 is the patient's responsibility and any sum in excess of \$90.00 likewise is the patient's responsibility.
 - (c) The cost of prenatal and postnatal care is provided.
3. Medicare pays for semiprivate accommodations in the hospital. The cost of private accommodations is covered by this plan only when the attending physician certifies that such accommodations are necessary.

A large, stylized handwritten signature in dark ink, appearing to read "J. M. Bergen". The signature is fluid and cursive, with a large loop at the end.

President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

85th CONGRESS GETS UNDERWAY WITH RECORD NUMBER OF BILLS INTRODUCED

The 85th, Democratic-controlled Congress is underway with a record number of bills introduced in the House on opening day. Experience has shown that about three per cent of all bills are found to be of major importance to medicine. As Congress opened, the Eisenhower administration, through HEW Secretary Folsum, announced part of its medical-welfare program for this year. Beyond much question, the new Congress, like the last one, will be anxious to vote large sums of money for existing programs, particularly research, and to set up new programs in the health and medical fields. This Congress probably will not be afraid of spending money or of starting health-medical programs that might be considered experimental.

However, because of the probable bi-partisan demands for a step-up in military and foreign spending, there cannot be unlimited military and foreign aid dollars and, at the same time, unlimited health-medical dollars.

As usual, a majority of the health bills won't even be considered seriously by the committees. Some will be the subject of hearings, but not reported out of committee. A few will move on to enactment. All bills not enacted or actually defeated, however, will hold over through 1958 and can be picked up at exactly the point they had reached at adjournment of the 1957 session.

Health and medical legislation which will probably receive the most serious consideration in this session includes:

Construction Grants for Medical Schools

The Administration is again asking Congress to authorize construction grants for medical, dental, public health and osteopathic schools. The money would be used to help pay for facilities for more students rather than for salaries of teachers or for maintenance costs.

Federal Workers' Health Insurance

The goal here is to produce a "package" bill with both basic and catastrophic coverage—one

that will meet the approval of the nonprofit plans, the commercial carriers and the federal employees unions. Two previous proposals—one for basic and the other for catastrophic coverage—have failed to pass because of objections of one or more groups to some aspect of the plans.

Voluntary Health Insurance

Both the Administration and the Democrats are working on ways to bring about more rapid expansion of health insurance. The Administration's reinsurance plan, twice rejected by Congress, remains in the background. Coming to the fore this year is a substitute plan which would permit smaller insurance companies to pool their resources without violating antitrust laws. It is felt this would stimulate coverage for major medical expenses for farmers, for the aged and for low-income families.

Tax Deferment on Retirement Plans

Interest has been renewed in the Jenkins-Keogh plan for permitting the self-employed to defer payment of taxes on money paid into retirement plans. Supporters of the proposal (including the American Bar Association and the AMA) point out that enactment of the plan would place professional groups on a par with employed persons. The cost of this proposal will be one of the points on which it will be vigorously attacked.

Regular Draft Amendment for Physicians

The six-year-old doctor-draft act expires July 1, 1957, and, barring any new emergency, the Defense Department says it will not ask Congress to extend it. In its stead, the Defense Department plans to ask for an amendment to the regular draft to provide for the selective call-up of doctors under the age of thirty-five who have been deferred to complete their educations. These groups have an obligation under their regular draft for two years of service unless excepted for specific reasons. Meanwhile, to encourage young doctors to take their military training after leaving medical school and possibly elect to make military-medicine a lifetime career, the services are sponsoring intern

and residency training programs. Under this special deferment plan, doctors promise active service at a later date.

Additional Social Security Amendments

If Congress runs true to form, there will be an abundance of bills designed to liberalize the much-amended Social Security Act. There will be demands for lowering the age for disability cash payments for temporary disability, for hospitalization of those over sixty-five who are eligible for current old age benefits and, to help finance these and other plans, a higher ceiling on earnings subject to social security tax.

With reference to the "payments to the disabled" amendment, the Social Security Administration is considering a recommendation from the Indiana State Medical Association to establish district or county committees of physicians to review individual doctors' medical findings under the new law providing O.A.S.I. payments to the disabled at age fifty. The committee would review the physician's report, further examine the applicant if so desired, and be authorized to file the final report of impairment determination and make recommendations as to whether the report might be reversible by medical or other rehabilitative measures. A similar recommendation is under study by the AMA Board of Trustees.

Federal Aid to the Aged

With Secretary Folsom heading the new Federal Council on Aging, it is expected that the Eisenhower Administration will put forth new efforts to help solve some of the social problems of the aged. In Congress, Senators Hill and Kennedy are expected to press for their bill which authorizes federal grants to states.

Appropriations for Health

In all likelihood, Congress will be asked to appropriate at least the same amount voted last year. In the Department of HEW, for example, Congress in 1956 approved over \$772 million for health programs.

Miscellaneous Legislation

Other measures bearing on the medical profession which will again come up in the 85th Congress include the Poliomyelitis Vaccine Grants Act, the Bricker Amendment, Federal Aid to Local Public Health Units and Nursing School Aid.

PERSONNEL CHANGES IN NEW DEPARTMENT

Marion B. Folsom stays on in his Cabinet post as Secretary of the Department of Health, Education and Welfare, but he will have several new top level aides.

Dr. Herold C. Hunt, HEW undersecretary, resigned in January to return as Eliot professor of educational administration at Harvard University. Dr. Lowell T. Coggeshall, special assistant for health and medical affairs, left to return to the University of Chicago, and Roswell B. Perkins, HEW assistant secretary, left in November to return to a New York law firm. He was responsible for developing HEW's legislative program and policies on Social Security matters.

Dr. Aims C. McGuinness will replace Dr. Coggeshall and Elliot Richards will replace Perkins. Dr. McGuinness is the former dean of the University of Pennsylvania Graduate School of Medicine and Richards is a thirty-six-year-old Boston attorney.

AIRCADE TEAM TO TAKE LEGISLATIVE ISSUES TO CITIES

The Chamber of Commerce of the United States has launched a unique legislative project of interest to physicians. A National Chamber team of experts spent all of February taking national issues directly to businessmen and professional people to spur them on to more intensive action. This "Aircade," which had Minneapolis on its schedule for February 11, will discuss many issues which affect medicine: Hoover Commission recommendations, government in the health insurance business, social security, government spending and taxes.

HEALTH GROUPS ASKED TO AID HUNGARIAN MEDICAL PERSONNEL

With more and more Hungarian physicians entering this country, the World Medical Association and the Health Resources Advisory Committee of the Office of Defense Mobilization in Washington has asked all American doctors to do everything possible to help these men and women who have fled from their homeland. This Advisory Committee adopted a resolution urging "every American health organization and educational institution to make every effort to lend its aid and resources toward the re-establishment of our new professional colleagues in situations com-

mensurate with their professional status. . . . To the dignity of political and personal freedom, let us help give them the dignity of professional status."

The A.M.A. has asked that county medical societies ascertain whether any Hungarian physicians have come into their communities and, if so, to plan some program for them so that their professional talents will be utilized in the most effective way possible.

TWENTY-FOUR PHYSICIANS RECEIVE SEARS-ROEBUCK GRANTS

Assistance in the form of long-term, unsecured loans to twenty-four physicians for the establishment and improvement of fifteen medical practice units has been announced by the Sears-Roebuck Foundation. The fifteen loans go to physicians in Oregon, Washington, Southeastern Kentucky, Minnesota, California, Mississippi, Georgia, North and South Carolina, southern Florida, New York, Rhode Island and Connecticut. Purpose of the plan is to help physicians supplement personal and local financing which is inadequate to cover the entire cost of building, remodeling, equipping or establishing a medical practice.

PHYSICIANS REMINDED OF PROFESSIONAL TAX DEDUCTIONS

When physicians figure their deductions for professional expenses on the Federal income tax return, most of them concentrate on the big items like salaries, depreciation and rent. But there are twenty-seven other varieties of business deductions most physicians are entitled to: They are: *Accounting* (amounts paid for bookkeeping services); *Automobile* (full operating cost of your car if used only for professional calls); *Bad debts*; *Clubs* (dues and expenses if necessary for maintaining business or professional contacts); *Collection expenses*; *Conventions* (cost of attending out-of-town medical meetings); *Credit Bureau fees*; *Depreciation* on all professional property; *Entertainment* (if necessary to practice); *Equipment*; *Gifts* (if necessary to practice); *Insurance* (premiums on policies related to your profession); *Interest* (on practice-connected loans and mortgages); *Journals and Books*; *Litigation expenses*; *Licenses*; *Loss* (from theft or damage or business property); *Maintenance* (if connected to office upkeep); *Medical Society Dues*; *Moving* (if connected with practice); *Refresher Courses*; *Rent*; *Repairs to*

office; *Salaries*; *Medical and Office Supplies*; *Taxes*; *Telephone and Telegraph*; *Travel*; and *Uniforms*.

There are also income tax deductions for volunteer work done for charitable organizations. You may not take a deduction for the value of the time you give but can count as a contribution any out-of-pocket expenses, that are directly connected with your volunteer activities (travel costs, costs of uniforms, et cetera).

Also keep in mind deductions allowed on your income tax for contributions to charity and your church and there are additional tax breaks on gifts of property or securities.

There is bad news for some taxpayers, however, in official proposals being readied for action in congress. These plans call for the closing of many favorite loopholes used by taxpayers for years. For example, stockholders in community-property states may lose some highly important tax advantages as may retired couples in those same states. The wealthy and moderately well-to-do men who have been piling up life insurance to pay their estate taxes may be due for a setback. Investors in some types of bonds may find a loophole tightly closed. Also taxpayers who have been enjoying double benefits on some deals may see these practices prohibited. The official plan is to close most of these loopholes retroactively, applying new amendments to much or all of 1956.

SURVEY REPORTS ON PHYSICIANS

Physician-Death Census

A study of all physician deaths between 1949-51 showed that there were six per cent fewer deaths among them than would have been expected among other white adult males. However, heart disease and diabetes hit physicians harder than other men.

Life expectancy for the medical profession was better at almost every age level than it was for other men.

Satisfaction With Career

If a doctor had his life to live over, would he choose medicine as his career? Ninety per cent of the physicians asked this question answered, "yes." In answer to the question, "Would you select your particular field of medicine?" 85 per cent of the psychiatrists answered yes; 82 per cent

(Continued on Page 140)

PARTICIPATION OF PHYSICIANS IN PRIVATE PRACTICE IN BASIC TUBERCULOSIS CONTROL PROCEDURES

Prevention

1. Phases of program in which physicians can participate in a professional capacity.

(a) It is the responsibility of all physicians not only to inform his own patients and their families about the dangers of tuberculosis, its mode of spread and methods of control, but also to assist in preparing the disseminating informational material to the public in co-operation with the health department, tuberculosis associations, and other agencies interested in control and treatment of tuberculosis.

- (b) Early casefindings and diagnosis:

(1) The doctor's office is a productive site for casefindings. The physician should consider the possibility of tuberculosis in every patient and examine as many as possible by roentgenologic study, especially those with any suspicious signs or symptoms or with history of exposure to tuberculosis, x-ray, tuberculin tests and bacteriological examination should be used as freely as possible.

(2) Physicians should examine all the contacts of their tuberculous patients to find the source of the disease and to detect its spread to others; or should make sure that they are examined by public health department or other clinics. Tuberculin tests and x-ray films should be used.

(3) All physicians should encourage their hospitals to establish a program of routine hospital admission x-rays; if such a program is in effect, to promote its fullest use. As far as admission and periodic chest x-ray films in mental and other institutions are concerned, physicians can influence the responsible operating agencies to institute such programs.

(4) Those physicians who sit on policy making committees should direct surveys to high prevalence areas.

(5) Private physicians should welcome and support community x-ray surveys; they should participate in them as pol-

icy makers; each physician should make certain that suspects screened out by the survey are examined carefully using all the appropriate diagnostic tools; he should sit in on film reading sessions.

(6) As consultants or board members for mental and penal institutions or as staff physicians, should promote routine and periodic chest x-raying in such institutions, as well as routine x-raying in jails.

(7) Physicians should support and use laboratory services as needed and especially in doubtful tuberculosis cases. Accepted laboratory techniques, particularly culture and guinea pig inoculation examinations should be used since one should not rely on direct smears.

(c) It is the duty of all physicians to do everything possible to hospitalize every open case of tuberculosis. If beds are not available, patients should be adequately isolated and treated at home. It is also the physician's responsibility to see that the patient remains under treatment for a period of time sufficient to reduce the possibility of relapse to a minimum.

(d) BCG vaccination of physicians, medical students, nurses, laboratory workers, contacts and others in the more vulnerable groups, who as non-reactors are exposed to tubercle bacilli, should be left to the discretion of the individual physician in the individual case.

2. Phases of the program in which physicians can actively co-operate with others in community projects.

(a) Private physicians should refer patients and families to health departments and other health agencies for bedside nursing care, assistance in isolation practices, epidemiologic investigations and family education.

(b) The private physician should refer tuberculous patients and their families to social services and public assistance agencies when necessary.

(c) Physicians, as citizens, can actively participate in community projects aimed at

slum clearance, low cost housing projects and other movements aimed at general betterment of the community.

(d) The practicing physician should emphasize the importance of pasteurization of milk and milk products, and should support the tuberculin testing program for eradication of tuberculous cattle.

B. *Treatment and Follow-up*

1. Private physicians have always played and will continue to play a prominent role in the treatment of tuberculosis. While government sanatoria care for the majority of hospitalized tuberculous, many chest physicians, internists, and other specialists, are on consultant staffs and play a dominant role in setting treatment policies.
2. In the absence of sanatorium or hospital beds, medical care of tuberculous patients at home is largely in the hands of private physicians. Organized home care programs are operating in many communities in which private physicians should actively participate; they should make certain that patients receive necessary nursing and other services to aid in carrying out medical recommendations.
3. The new drugs have increased the number of tuberculous patients who are eligible for post-sanatorium ambulatory treatment. A large number of these are under the supervision of either private physicians or public clinics.
4. Physicians should perform and stimulate regular follow-up examination of tuberculous patients in the doctor's office or chest clinics. Physicians in private practice often serve part-time in tuberculosis or chest clinics, and all physicians should encourage good clinic service. Private physicians should welcome the help of public health nurses with patients' families and contacts to keep them under medical supervision and increase their understanding of the disease and its spread. In some communities medical social workers are available and can visit patients with social problems. Occasionally voluntary associations employ occupational therapists who can be of assistance to patients in their homes.
5. Ideally, no diagnosed case of tuberculosis should ever be dropped from periodic examination. However, after tuberculosis patients have been inactive for two years close supervision can be relaxed. Physicians

should, nevertheless, advise their patient with inactive disease to have an annual examination including an x-ray film.

C. *Reporting*

1. Physicians should routinely and promptly make out morbidity cards on cases of tuberculosis which come to their attention. If there is any doubt about a previous report being made, the physician should make one out anyhow to assure the completeness of registration and epidemiological follow-up. Death certificates should not only indicate tuberculosis as an immediate or ultimate cause of death, but also as an accompanying condition when present.
2. Private physicians should provide health departments with information about the current status of tuberculosis patients under their care so that continued knowledge and supervision of all cases of tuberculosis in the community is assured.

D. *Provision to the patient of indicated ancillary services*

1. It is the responsibility of the private physician to assess the patient's capacity for work in terms of residual disease in the lung and/or other organs and determine the amount and types of activity permissible for the individual. He must make decision as to whether or not the patient can return to his former occupation or whether he should return to one requiring less physical exertion. In this decision as in those relating to diagnosis and treatment he can to advantage avail himself of specialist consultation.
2. When it is evident that the patient is in need of vocational training to equip him to enter a new occupation, the physician should be aware of the facilities available for such training. He can call upon the services of the vocational counselor of the Division of Vocational Rehabilitation in his State or territory to assist him.

Council on Public Health

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 Leo V. Schneider, Bethesda, Maryland
 Rufus Schneiders, San Diego, California

Meetings and Announcements

STATE

MINNESOTA STATE MEDICAL ASSOCIATION, 4th annual meeting, Saint Paul, May 13, 14 and 15, 1957.

NATIONAL

American College of Gastroenterology, Central Regional Meeting, Grand Rapids, Michigan, March 17. Secretary, American College of Gastroenterology, 33 West 4th Street, New York 23, New York.

American Congress of Physical Medicine and Rehabilitation, thirty-fifth annual scientific and clinical session, Los Angeles, September 8-13, 1957.

The Children's Hospital of Philadelphia. Three short refresher courses. "Pediatric Advances for Pediatricians and General Practitioners," May 27-31, 1957. "Practical Pediatric Hematology," June 3-5, 1957. "Blood Group compatibilities and Erythroblastosis Fetalis," June 6-7, 1957. Irving J. Wolman, M.D., Children's Hospital of Philadelphia, 1740 Bainbridge Street, Philadelphia 46, Pennsylvania.

Eighth Annual Symposium on the Recent Advances in the Study of Venereal Diseases, Department of Health, Education and Welfare Auditorium, Washington, D. C., April 24-25.

First American Post-Graduate Assembly in Fertility and Sterility, New York Medical College-Metropolitan Medical Center, May 18-31. Dr. Ralph E. Snyder, Chairman, New York Medical College, 1249 Fifth Avenue, New York 29, New York.

Institute of Industrial Health, University of Cincinnati—course in industrial health for registered nurses only, March 25-29. Secretary, Institute of Industrial Health, Kettering Laboratory, Eden and Bethesda Avenues, Cincinnati 19, Ohio.

New York University Post-Graduate Medical School. Part-time review course in cardiology for general physicians and internists. Thursdays, 2-5 p.m., April 11 to May 23, 1957. Full-time review course on cardiology, May 6-24, 1957. The Dean, Post-Graduate Medical School, 550 First Avenue, New York 16, New York.

New York University Post-Graduate Medical School. Course on Orthopedic Aspects of the Treatment of Rheumatic Disorders, three successive Thursdays, from March 19 through April 2. The Dean, New York Post-graduate Medical School, 550 First Avenue, New York 16, New York.

INTERNATIONAL

Canadian Medical Association, Edmonton, Alberta, Canada, June 17-21. Dr. A. D. Kelly, 150 St. George Street, Toronto 5, Ontario, Canada.

Congress of International Association for Study of the Bronchi, Lisbon, Portugal, May 25-26. Prof. F. Lopo de Varvalho, 138 rua de Junqueira, Lisbon, Portugal.

Congress of International Society for Cell Biology, St. Andrews, Fife, Scotland, August 28-September 3. Prof. H. G. Callan, Bell Pettigrew Museum, The University, St. Andrews, Fife, Scotland.

Congress of International Society of Orthopedic Surgery and Traumatology, Barcelona, Spain, September 16-21. International Society of Orthopedic Surgery and Traumatology, 34 rue Montoyer, Brussels, Belgium.

Congress of International Society of Surgery, Mexico City, Mexico, October 27-November 2. Dr. L. Dejardin, 141 rue Belliard, Brussels, Belgium.

Fourth International Poliomyelitis Conference, Geneva, Switzerland, July 8-12. Registration deadline, April 1. Fourth International Poliomyelitis Conference, Secretariat, Hotel du Rhone, Geneva, Switzerland.

Inter-American Congress of Pan American Medical Association, Mexico City, Mexico, November 18-22. Dr. Joseph J. Eller, 745 Fifth Avenue, New York 22, New York.

International Conference on Audiology, St. Louis, Missouri, May 13-16. Dr. S. Richard Silverman, 818 South Kingshighway, St. Louis, Missouri.

International Congress of Clinical Pathology, Brussels, Belgium, July 15-20. Prof. M. Welsch, Universite de Liege, 32 Blvd. de la Constitution, Liege, Belgium.

International Congress of Dermatology, Stockholm, Sweden, July 31-August 6. Dr. C. H. Floden, Karolinska, Sjukhuset, Hudkliniken, Stockholm 60, Sweden.

International Congress of Electroencephalography and Clinical Neurophysiology, Brussels, Belgium, July 21-28. Dr. R. G. Bickford, Mayo Clinic, Rochester, Minnesota.

International Congress of International Society of Bronchoesophagology, Philadelphia, Pennsylvania, May 12-13. Dr. Chevalier L. Jackson, 3401 North Broad Street, Philadelphia.

International Congress on Medicine and Surgery, Turin, Italy, June 1-9. Secretariat, Minerva Medica, Corso Bramante 83-85, Turin, Italy.

International Congress of Neurological Sciences, Brussels, Belgium, July 21-28. Dr. Pearce Bailey, National Institutes of Health, Bethesda 14, Maryland.

International Congress of Neurosurgery, Brussels, Belgium, July 21-28. Dr. William B. Scoville, 85 Jefferson Street, Hartford, Connecticut.

International Congress of Neuropathology, Brussels, Belgium, July 21-28. Dr. Ludo J. Bogaert, 47 rue de l'Harmonie, Antwerp, Belgium.

International Congress of Nutrition, Paris, France, July 24-29. Congress International de Nutrition, 71 Blvd. Pereire, Paris 17e, France.

International Congress of Otolaryngology, Washington, D. C., May 5-10. Dr. Paul H. Molinger, 700 North Michigan Avenue, Chicago 11, Illinois.

International Congress on Rheumatic Diseases, Toronto, Ontario, Canada, June 23-28. International Congress on Rheumatic Diseases, P.O. Box 237, Terminal "A," Toronto, Ontario.

International Gerontological Congress, Merano-Bolzano, Italy, July 14-19. Segreteria, Quarto Congresso Internazionale de Gerontologia, Viale Morgagni, 85, Firenze, Italy.

International League Against Epilepsy, Brussels, Belgium, July 21-28. Dr. Radermecker, Institut Bunge, 59 rue Philippe Milliot, Berchem, Antwerp, Belgium.

International Symposium on Medical-Social Aspects of Senile Nervous Diseases, Venice, Italy, July 20-21. Secretariate, Viale Morgagni 85, Firenze, Italy.

International Voice Conference (Laryngeal Research Function and Therapy), Chicago, Illinois, May 20-22. Dr. Hans von Leden, 30 North Michigan Avenue, Chicago 2, Illinois.

Neuroradiologic Symposium, Brussels, Belgium, July 21-28. Professor Melot, Hôpital Universitaire St. Pierre, Brussels, Belgium.

Pan-Pacific Surgical Association, seventh congress, Honolulu, Hawaii, November 14-22, 1957. Write Dr. F. J. Pinkerton, director-general of the Pan-Pacific Surgical Association, Room 230, Young Building. Honolulu, Hawaii.

AMERICAN COLLEGE OF SURGEONS TO HOLD SECTIONAL MEETING IN SAINT PAUL

A Sectional Meeting of the American College of Surgeons will be held at the Lowry and Saint Paul Hotels in St. Paul, April 8-10, 1957. Dr. Charles E. Rea is chairman of the committee arranging for this meeting for surgeons in the north central states.

Papers will be presented on such subjects as Hazards of Blood Transfusions, Treatment of Massive Upper Gastrointestinal Tract Hemorrhages, Whiplash Injuries, Prevention of Injuries, Hemorrhagic Diseases Related to Surgery, Fracture of the Larynx, Inguinal and Femoral Hernioplasty, Megacolon in Infants and Children, Tendon Injuries in the Hand, and Prostheses for Amputees.

Symposia have been arranged on What's New in Surgery, Orthodox Versus Newer Concepts in Treatment of Breast Cancer, Care of Patients with Gastrotomy, Ileostomy or Colostomy, Where to Begin and What to Do for Patients with Multiple Injuries, and Peripheral Vascular Surgery. Panel discussions will be held on Conservation of Ovarian Tissue and Biliary Tract Surgery.

There will be a separate program for specialists in ophthalmic surgery, including a symposium on Industrial Ophthalmology.

Fellows, members of the candidate group, interns and residents may attend this session free of charge, but there will be a \$5.00 registration fee for non-fellows.

BLUE SHIELD MEETS NEW CHALLENGES

(Continued from Page 130)

other Plans have promised to "go along" in the near future.

While this degree of co-ordination of benefits (in terms of covered services) has been found necessary to meet Blue Shield's enrollment challenge, each Plan will still make payments to physicians according to its locally negotiated schedules, and will calculate its own subscription rates.

This significant achievement of Blue Shield shows its ability to meet new conditions and proves the capacity of medicine's voluntary prepayment movement to solve whatever problems it may encounter.

PROFESSIONAL RELATIONS COMMITTEE
Blue Shield Medical Care Plans
Chicago, Illinois

SURVEY REPORTS ON PHYSICIANS

(Continued from Page 136)

of the internists; 81 per cent of the surgeons; 78 per cent of the obstetricians; 66 per cent of the G. P.'s and 63 per cent of the pediatricians.

Attendance at Medical Meetings

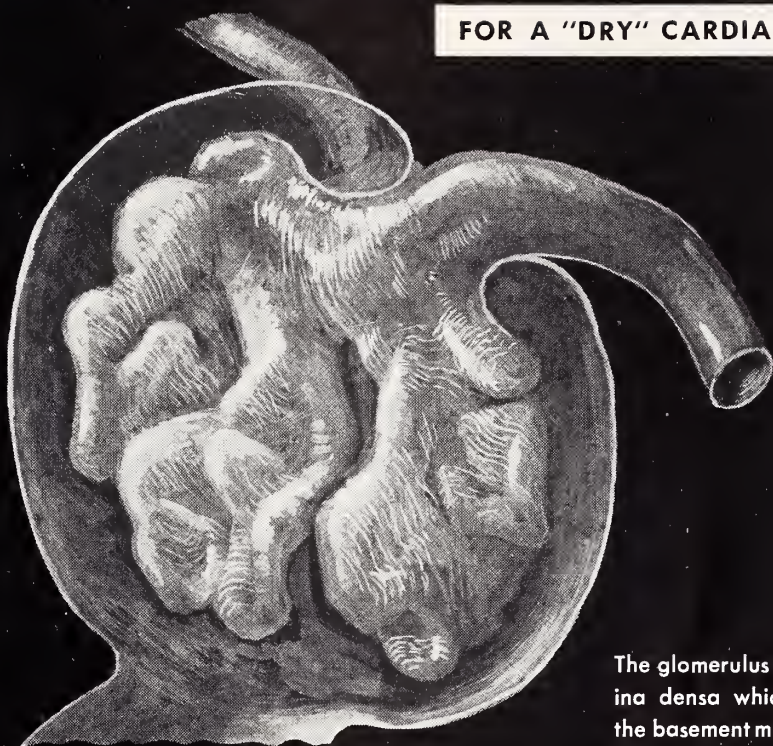
According to a recent survey, 50 per cent of the doctors questioned, attend "most meetings" of their local or county society. The problem of meeting attendance seemed greatest in the East where only 38 per cent said they attended most meetings while in the West the percentage increased to sixty-one.

PLEURAL EFFUSION

(Continued from Page 106)

2. DeFrancis, N.; Klosk, E., and Albano, E.: Needle biopsy of the parietal pleura. *New England J. Med.*, 252:948-949 (June 2) 1955.
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4. Sutliff, W. D.; Hughes, F.; and Rice, M. L.: Pleural biopsy. *Dis. of the Chest*, 26:551-557 (Nov.) 1954.
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Illustration by Hans Elias

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Research in the Service of Medicine.

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SEARLE

Woman's Auxiliary

AMA AUXILIARY CAMPAIGN AGAINST CANCER

Members of the Woman's Auxiliary to the American Medical Association throughout the country have adopted a plan for an intensive education campaign against cancer, as announced by the American Cancer Society and the Woman's Auxiliary to the American Medical Association. An especially prepared Cancer Education Program Kit, currently being sent to all American Medical Association Auxiliaries, will serve as guides for program building for these all-important leaders.

In announcing the plans for the co-operative venture, Mrs. John H. Cameron, Crookston, Cancer Chairman for the Minnesota State Medical Association Auxiliary, said: "We have come to know by bitter experience what a devastating disease such as cancer can do to victim and family alike. When a home has been broken because of a needless death, the tragedy is all the greater. Therefore, we are eager to do all we can to educate ourselves and our friends with the Society's life-saving message."

Allan Stone, Executive Director, Minnesota Division, American Cancer Society, expressed gratitude for this co-operation and pointed out the startling number of lives lost because proper treatment was begun too late—80,000 Americans last year. "Anything which the Woman's Auxiliary to the American Medical Association can do to aid in reducing this dreadful toll will be of lasting effect in the total cancer picture," he said.

STATE CHAIRMEN OUTLINE 1957 PROJECTS Cancer

Another Auxiliary work year is at hand and it is indeed gratifying that so many units have appointed cancer chairmen who will be able to devote more time to this important project and to whom we might channel information directly.

Through the efforts of Allan Stone, executive director of the Minnesota Division, American Cancer Society, Inc., cancer chairmen have received copies of the cancer education kits for the Auxiliary. Local chairmen are asked to study these carefully and then outline their group's participation on as large a scale as possible, particularly in education. The Cancer Society will also help make arrangements for speakers for programs.

Suggested reading in this field is the Minnesota Cancer Committee's report. "Minnesota Doctors Are Beginning to Detect Occult Cancer," found on page 746, November, 1956, issue of MINNESOTA MEDICINE. This should arouse and convince everyone of the urgency of 100 per cent participation in the cancer crusade and, as stated by the Cancer Committee, "the benefits from co-operative statewide effort will be incalculable."

MRS. J. H. CAMERON, Crookston
State Auxiliary Cancer Chairman

Mental Health

Mental Health Week, which takes place the last week in April, will soon be here, and we urge all our Auxiliary groups to make plans for some type of program. There are many things one can do to help the mentally-ill, depending on the locality. If you are near a mental hospital, orphanage or a home for the aged, anything you can do to help make the patients happy is always appreciated. Mental Health involves so many things besides the mentally ill, however. What we would like to do is to educate our people so they have happier lives and are therefore mentally strong.

We would like to start our high schools using the "Milestones to Marriage" series. This is a very well-written series of letters to high school seniors. The means of financing such a project is always a problem but these groups have been found willing to help: the Mental Health Association, city or county boards of education, local high school funds, student projects, P.T.A., Kiwanis, Rotary, Lions, or Chamber of Commerce groups, foundations, individuals, et cetera.

We ask all Auxiliary groups to use to the best advantage the material sent them on mental health.

MRS. W. P. GJERDE, Lake City
*State Auxiliary Mental
Health Chairman*

Science Fairs

Again this year the AMA will award citations to top scientific youth at the 1957 National Science Fair in Los Angeles, May 9-11. In addition, the two first-place winners will be invited to exhibit their projects at the 106th annual AMA meeting in New York City June 3-7. Participation of state and county groups in last year's fairs brought a great deal of favorable public comment and proved to be a very successful venture in youth guidance and community relations.

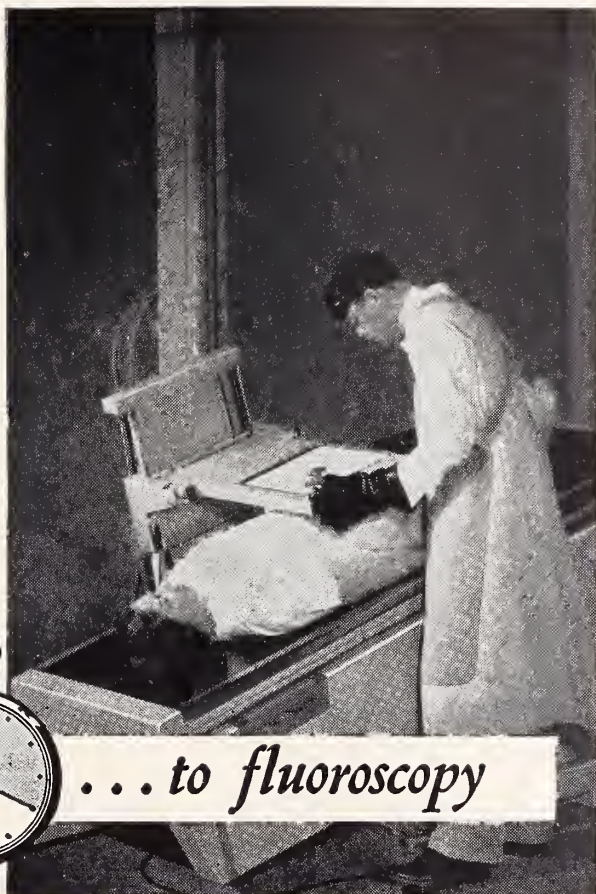
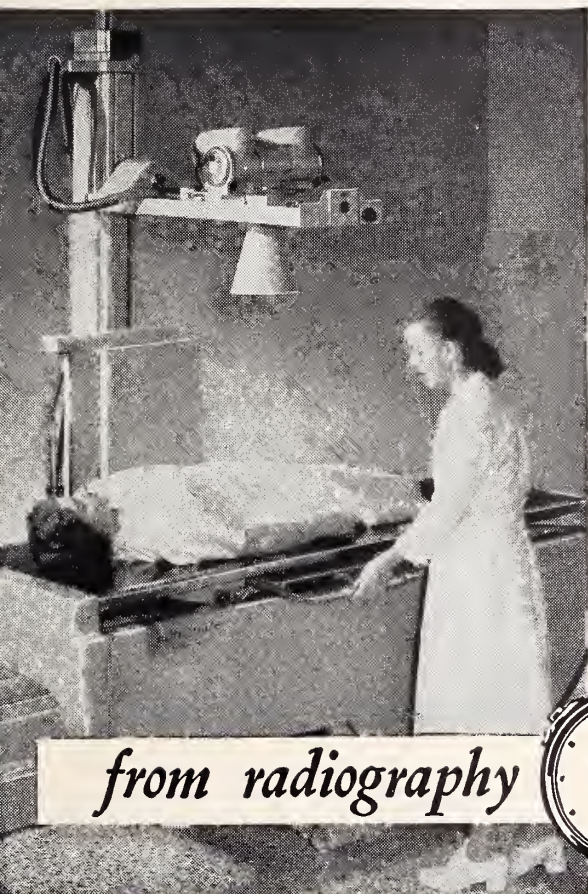
The Minnesota State Medical Association has endorsed the support of local fairs by state and county medical societies, and encourages the Auxiliary to adopt this as a worthy project.

A science fair is an exhibition of scientific projects prepared by elementary and high school students for showing to their classmates, teachers, parents and the public. Local winners go on to compete in regional science fairs and then on to the national science fair where the AMA presents its special awards.

Groups interested in this very worthwhile project may check with local high school science instructors and principals for possible sponsorship of a fair. For further information on how to organize these fairs, you may write to Science Clubs of America, 1719 N Street N.W., Washington 6, D. C. Almost all fairs are concluded by late April so the winners may prepare for the national competition.

(Continued on Page A-40)

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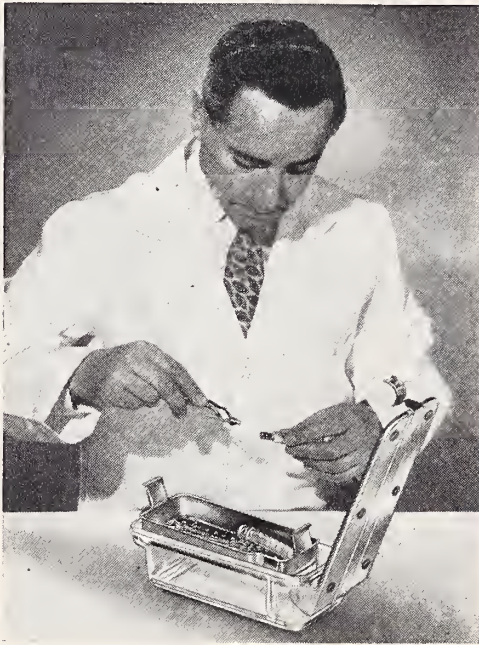
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STATE CHAIRMEN OUTLINE

(Continued from Page A-38)

Every group participating in these fairs is performing an outstanding service, because the continued success of our industries and professions depends on an adequate supply of scientists and technologists. Also, the program serves a fine "career-counseling" purpose for youth and is an excellent anti-delinquency program.

MRS. PHILIP K. ARZT, St. Paul
State Auxiliary Program and
Health Education Chairman

NEWS FROM THE COUNTY AUXILIARIES Red River Valley

The Woman's Auxiliary to the Red River Valley Medical Society held a joint dinner meeting with their husbands December 7, 1956, at Sidney's Cafe in Crookston. Following the dinner the women adjourned to the home of Dr. and Mrs. A. R. Reff for their meeting.

Renville-Redwood

Dr. and Mrs. G. E. Nelson and Dr. and Mrs. J. F. Haas, Fairfax, were hosts to the Renville-Redwood Medical Society and its Auxiliary at the Nelson home Thursday, December 20. A turkey dinner was served by the hostesses. Instead of exchanging gifts the collection taken was used for an educational fund. Following dinner, the Auxiliary had a short meeting. Mrs. A. W. Diessner, Redwood Falls, is the new president of the group.

St. Louis County

The Auxiliary met Tuesday, January 8, for a 1:00 p.m. luncheon at the Duluth Athletic Club. Note author Margaret Culkin Banning was guest speaker.

Winona County

The Winona County Auxiliary celebrated the holiday with a luncheon at the home of Mrs. W. O. Finkelnburg, Winona. During the business session the group voted that a sum of \$25.00 be donated to Hungaria relief.

* * *

Contributions for this column, including news and activities of state auxiliary societies and items of interest about members, may be sent to Mrs. A. B. Rosenfield, Woman's Editor, MINNESOTA MEDICINE, 2920 Dea Boulevard, Minneapolis, Minnesota.

It is generally accepted that tuberculosis is the most common cause of pulmonary cavitation. The tuberculosis is a frequent occurrence in third-stage silicosis is evident when one considers that over 50 percent of the conglomerate masses are said to be infected with tuberculosis. Thus, when cavitation occurs in conglomerate mass, it is usually presumed to be of tuberculous nature. However, the occurrence of non-tuberculous cavitation must not be overlooked.—C. S. MORROW, M.B., and R. N. ARMEN, M.D., *Annals of Internal Med.*, Oct., 1956.

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In Memoriam

JEAN T. LAPIERRE

Dr. Jean T. Lapierre, Minneapolis, died December 25, 1956. He was fifty-eight years old.

A life-long Minneapolis resident, Dr. Lapierre attended St. Thomas College, St. Paul, and graduated from Creighton Medical School, Omaha, in 1924. He was a fellow of the American College of Surgeons, a staff member of St. Mary's Hospital, Minneapolis, and a member of the Hennepin County Medical Society, the Minnesota State Medical Association and the American Medical Association.

He also belonged to the Minneapolis Athletic Club, Interlachen Club, St. Anthony Commercial Club and the Foresters.

Survivors include two sisters: Mrs. Esther Barry, St. Paul, and Mrs. E. W. Beauchamp, Springfield, Mass., and two brothers, Dr. Arthur Lapierre and Dr. Maurice Lapierre, both of Minneapolis.

FREDERICK J. PLONDKE

Dr. Frederick J. Plondke, founder and long-time medical director of St. John's Hospital, St. Paul, died here January 2, 1957. He was eighty-seven years old.

Dr. Plondke was the first graduate of Morningside College, Sioux City, Iowa, where he received a Bachelor of Science degree in 1894. In 1898 he received his medical degree from the University of Pennsylvania and the following year set up practice in St. Paul. He founded St. John's Hospital in 1911 and served as medical director for forty years and as chief of staff for more than thirty years. Upon his retirement in 1955 he was given the title of honorary chief of the surgical service and continued as a member of the governing board of the hospital.

A member of the staff of Hamline University, Dr. Plondke was professor of histology from 1901 to 1903 and later was professor of clinical pathology. He was also pathologist at Ancker Hospital.

Dr. Plondke was a major in the Minnesota National Guard and headed medical units during the Moose Lake and Cloquet fires. He was a past-president of the Ramsey County Medical Society, a member of the Minnesota State Medical Association, the American Medical Association, the Shrine and the Evangelical and Reformed Church.

His wife, the former Madeline May Bruchman, survives.

The ancient art and the burgeoning science of medicine know no national or racial distinctions. Medicine, like art and music, speaks with a human tongue, and its knowledge and techniques are dedicated to all mankind. Ed. *World Med. J.*, May, 1956.

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General Interest

Dr. George R. McNear, Jr., Mankato, has been elected president of the Blue Earth County Medical Society for the coming year. Dr. E. E. Heller and Dr. Donald B. Swenson, both of Mankato, were elected vice-president and secretary-treasurer, respectively.

* * *

Dr. J. C. Feuling, Duluth, is the newly-elected president of the St. Louis County Medical Society for 1958. Installed as president for 1957 at the December meeting of the Society was Dr. E. E. Barrett. Retiring president was Dr. A. J. Bianco. Both are from Duluth. Dr. R. E. Hansen, Hibbing, is vice-president; Dr. R. O. Bergen, Duluth, secretary-treasurer. Elected to the advisory committee for the next three years were Dr. K. E. Johnson, for 1957; Dr. A. L. Abraham, for 1958, both of Duluth, and Dr. K. L. Butler, for 1959, Cloquet.

Other physicians voted into office include Drs. A. G. Athens, M. F. Fellows, both of Duluth, and L. W. Johnson, Hibbing, state advisory committee; Drs. P. N. Bray, J. E. Haavik, G. C. MacRae, O. L. McHaffie, all of Duluth, and W. S. Neff, Virginia, nominating committee.

Judiciary committee: Drs. A. G. Athens, G. C. MacRae and D. W. Wheeler, all of Duluth, 1957; Drs. P. N. Bray, C. O. Kohlbray, and Archie Olson, all of Duluth, 1958, and Drs. M. G. Gillespie, P. S. Rudie, both of Duluth, and Clarence Jacobson, Chisholm, 1959.

Economics Committee: Drs. M. G. Fredricks, H. O. Hoff and O. E. Sarff, all of Duluth, 1957; Drs. Walter Kelley, William Martin, both of Duluth, and K. E. Ahola, Hibbing, 1958; and Drs. C. M. Bagley, J. J. Coll, both of Duluth, and R. H. Puumala, Cloquet, 1959.

Grievance committee: Drs. Feuling and M. J. McKenna, Grand Rapids, 1957; Drs. L. L. Merriman and J. H. Peterson, Duluth, 1958; and Drs. McHaffie and D. W. Wheeler, Duluth, 1959.

Delegates: Drs. R. P. Buckley and McHaffie, 1957; Drs. K. R. Fawcett and Feuling, 1958, all of Duluth; and Drs. J. K. Butler, Cloquet, and J. A. Malmstrom, Virginia, 1959.

Alternate delegates: Drs. Josiah Fuller and F. W. Conley, 1957; Drs. J. D. Barker and H. J. Walder, 1958, all of Duluth; and Drs. H. H. Joffe and Paul Reed, both of Virginia, 1959.

* * *

Dr. Wallace E. Anderson, Clearbrook, has been elected 1957 president of the Red River Valley Medical Society. Other officers include: Dr. Byron Kinkade, Ada, vice president, and Dr. R. O. Sather, Crookston, secretary-treasurer. Dr. E. E. Pumala, Warren, was elected to the board of censors; Dr. George Sather, Fosston, was elected delegate to the Minnesota State Medical Association with Dr. O. K. Behr, Crookston, alternate delegate.

These physicians were elected at the December meeting of the group. Speaker for the meeting was Dr. John

McKelvey, chief of the Department of Obstetrics and Gynecology at the University of Minnesota, who discussed reasons for the decline in maternal mortality in the state since 1941.

* * *

Dr. and Mrs. A. R. Neff, Crookston, entertained the members of the Woman's Auxiliary to the Red River Valley Medical Society at the December meeting of the group.

* * *

Dr. and Mrs. G. E. Nelson and Dr. and Mrs. J. L. Haas, Fairfax, were hosts to the Renville-Redwood Medical Society and its Auxiliary at a Christmas meeting in December. Dr. A. W. Deissner, Redwood Falls, was elected new president of the Society; Mrs. Deissner the Auxiliary president.

* * *

The Scott-Carver Medical Society held its December meeting in Jordan at the Colonial Club. Attending from Shakopee were Dr. L. H. Heinz, Dr. I. B. Hein, Dr. and Mrs. B. F. Pearson and Dr. and Mrs. J. J. Ponterio.

* * *

Dr. O. B. Fesenmaier, New Ulm, has been appointed second district public health officer to fill the vacancy created by the death of Dr. H. J. Nilson, North Mankato.

* * *

Dr. Thomas E. Vanderpool, Litchfield, has been elected secretary-treasurer of the staff of Paynesville Community Hospital. New staff members include Drs. Frank J. Ankner, Minneapolis, John W. Docksey, Roger J. Michels, Austin M. McCarthy, all of Willmar, and Rosemary R. Frear, Broton.

* * *

Mrs. John F. Pewters, mother of Dr. John T. Pewters, Minneapolis, died December 24, in Seattle, Washington.

* * *

Dr. James Dokken, Windom, was the featured speaker at the November meeting of the ninth district nurse association. His topic was tranquilizing drugs. He also discussed the book "How to Live 365 Days A Year." The meeting was held in Mountain Lake.

* * *

Dr. Frederick S. Schnell, president of the Kandiyohi Swift-Meeker County Medical Society, presided at the annual Christmas meeting of the group held in Willmar. Dr. Roger P. Michels, Willmar, led the group in community singing, and the featured speaker of the evening was Wilbur Elston, editorial page editor of the *Minneapolis Star and Tribune*, who discussed the Middle East situation.

* * *

As of February 1, 1957, Dr. William A. Chervena

(Continued on Page A-44)



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(Continued from Page A-42)

formerly with the Mesaba Clinic in Chisholm, became associated with the Long Prairie Clinic and its staff, Drs. A. H. Borgerson, A. Erickson, and M. E. Moser.

* * *

Dr. Joseph J. Garamella, clinical instructor in surgery at the University of Minnesota Medical School, has been named the first appointee to the Rappaport Professorship of Cardiac Research at Mount Sinai Hospital, Minneapolis. The professorship was established in 1955 with an initial gift of \$55,000 by the Rappaport family of Minneapolis, and provides for a permanent research post to be occupied by a medical scientist designated by the University of Minnesota. Dr. Garamella, age thirty-seven, is a thoracic surgeon, who has devoted the last two years to the investigation of surgical aspects of coronary heart disease and allied problems at Mount Sinai. He is a diplomate of the American Board of Surgery and the American Board of Thoracic Surgery. One of his research problems will be the use of surgical means of improving the circulation of coronary arteries.

* * *

At the January 8 meeting of The Minnesota Society of Neurology and Psychiatry, Dr. Richard M. Magruder presented his inaugural thesis on "An Operational Classification of Psychosomatic Disorders." By invitation, Drs. Ralph Suechting and Lyle French discussed "Isotope Encephalometry."

* * *

Drs. G. K. Stillwell, instructor in physical medicine and rehabilitation, and Khalil G. Wakim, professor of physiology, at the Mayo Foundation, Rochester, were among a group of national authorities in physical medicine who served as the faculty at a three-day symposium, December 6-8, 1956, at the University of Minnesota Center for Continuation Study, sponsored jointly by the University of Minnesota and the Sister Elizabeth Kenny Institute.

* * *

On December 1, 1956, Dr. Richard W. Anderson joined the staff of the new East Range Clinic at Aurora, Minn. The Range is not new to Dr. Anderson, since he was born at Hibbing, graduated from high school in Keweenaw, Minn., and attended Hibbing Junior College. He is a graduate of the University of Minnesota School of Medicine, and served with the U. S. Air Force.

* * *


Dr. and Mrs. Charles W. Mayo of Rochester attended a dinner and program honoring Prime Minister Nehru of India in New York, December 19, 1956. Dr. Mayo, a former U.N. alternate delegate, introduced Mrs. Eleanor Roosevelt, who in turn introduced Prime Minister Nehru to the audience.

* * *

Dr. and Mrs. John C. Wohlrabe, St. Clair, are the parents of a daughter born December 21, 1956.

* * *


At the December 12, 1956, meeting of the Minnesota Academy of Medicine, held at the Town and Country Club in St. Paul, there were forty-four members present. Dr. F. H. K. Schaaf, Minneapolis, read a paper entitled




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rugs, Devils and Doctors—Modern Version,” illustrated by slides, and Dr. Ben Sommers, St. Paul, reted on “A Case of Hemochromatosis,” illustrated h x-ray pictures. Dr. C. J. Watson, Minneapolis, led discussion on this case.

* * *

Dr. Philip Maus has resumed his position with the wson Clinic after two years' military service in nama.

* * *

The medical staff at Abbott Hospital, Minneapolis, elected the following officers for 1957: president, John T. Pewters; vice president, Dr. Stuart Lane ey; secretary, Dr. John W. Johnson; executive comtee, Drs. Karl Sandt, Tague Chisholm, and Richard Fliehr.

* * *

Two University of Minnesota scientists, Dr. C. Walton llehei and Dr. Richard A. DeWall, were awarded the t Ida B. Gould Memorial Award for research on diovascular problems by the American Association the Advancement of Science in late December, 1956. Lillehei was cited for his pioneering work in open ry heart” surgery and Dr. DeWall for his development the “bubble oxygenator” which is used in dry heart erations. The citation accompanying the \$1,000 ard said that their work in developing techniques d apparatus for the direct-view heart surgery has pped to extend this type of surgical repair to more bes of heart disease and more institutions. Dr. Paul idley White, heart specialist to President Eisenhower, s chairman of the committee of judges for this award.

* * *

Dr. Frank Boyle, who has been associated with Drs. alter H. Valentine and R. R. Rensberg at Tracy, has ened a part-time office at Currie and plans to spend o mornings and Wednesday evenings of each week that village.

* * *

The Minnesota state organization of the American ncer Society has awarded grants totaling \$8,816 to o Minneapolis hospitals and four doctors for cancer ntrol projects in Hennepin County. St. Barnabas ospital received \$2,400 to support a tumor registry der the direction of Dr. Nathaniel H. Lufkin. Genal Hospital was given \$3,600 for operational expenses the cancer conference and cancer registry, under e direction of Dr. Claude Hitchcock, chief of surgery. t General, Drs. Hitchcock, John I. Coe and H. Dawes iller were awarded \$2,816 for a study of proteins in stric juices.

* * *

The Williams and Wilkins Company, medical publishg house in Baltimore, Maryland, began publication February of a new journal entitled *Survey of Anesiology*. Dr. Albert Faulconer, Jr., head of the anesesia section of the Mayo Clinic, has been named an sociate editor. He is one of nineteen specialists who ill analyze and comment on condensations of papers n anesthesiology published throughout the world. Anher Mayo Clinic physician, Dr. T. H. Seldon, is edi-

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tor of another anesthesiology publication, "Anesthesia and Analgesia—Current Researches."

* * *

Officers of the Freeborn County Medical Society for 1957, elected at the December meeting are: president, Dr. Ove A. Erdahl; vice president, Dr. Marcus Keiser and secretary-treasurer, Dr. Leon E. Steiner, all of Albert Lea.

* * *

Dr. Leon E. Steiner has succeeded Dr. Leonard Ellerson as chief of staff at Naeve Hospital, Albert Lea. Other staff officers include Dr. Alfred K. Sherman, vice president, and Dr. F. W. Calhoun, secretary-treasurer.

* * *

Newly elected staff officers at Immanuel Hospital, Mankato, include Dr. L. M. Hammar, Mankato, re-elected president; Dr. P. M. Smith, Lake Crystal, vice president; Dr. J. J. Heimark, secretary; Drs. B. J. Geurs, H. R. Snider, and U. H. Zee, all of Mankato members of the executive committee.

* * *

Dr. Simon Dack, president of the American College of Cardiology and chief of the cardiac clinic at Mount Sinai Hospital, New York, participated in a discussion before the Hennepin County Medical Society, Monday, January 7, on the controversial issues in the diagnosis and treatment of coronary heart disease. Other participants in the forum were Dr. Raymond D. Pruitt, Mayo Clinic, and Dr. H. B. Sweetser, Minneapolis.

* * *

A St. Paul doctor and his wife, Dr. and Mrs. Francis A. Goswitz, both interns at the University of Iowa hospital, Iowa City, jointly won a \$250 research award in the Schering Award Contest for medical students in the United States and Canada. The award was given for a paper on "New Applications of Antihistamines in Medicine and Surgery."

* * *

On Sunday, January 13, "Medical Horizons," an ABC network TV program, originated at the Mayo Clinic, and was devoted to the subject of duodenal ulcers. Participating in the live program were Dr. Charles Code, physiologist; James M. Cain and William Sauer, internists; and Dr. Waltman Walters, surgeon.

* * *

Dr. H. E. Michelson, Minneapolis, professor of dermatology at the University of Minnesota, was invited to give the dermatologic oration at the 150th anniversary celebration of the New York State Medical Society, February 20. His subject was "Comparative Diagnostic Approaches in Dermatology and Internal Medicine."

* * *

Dr. Edgar V. Allen, internist of the Mayo Clinic and professor of medicine in the Mayo Foundation, Graduate School, University of Minnesota, addressed the Indiana Heart Foundation in Indianapolis on January 31; the Louisville Heart Association in Louisville, Kentucky, on February 2; and the Minnesota Heart Association in Minneapolis on February 4, on the subject, "The American Heart Association."

Dr. Allen is president of the American Heart Association.

Book Reviews

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

THE MECHANISMS OF HEALING IN HUMAN WOUNDS. Shattuck W. Hartwell, M.D. Springfield, Illinois: Charles C Thomas, 1955.

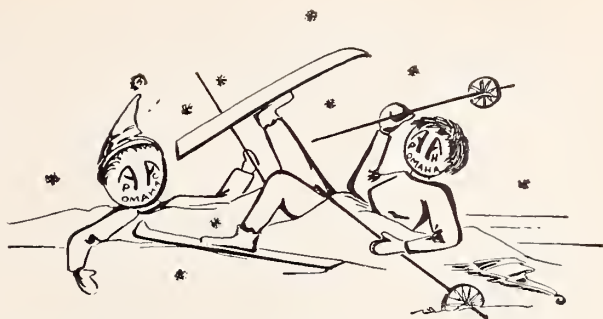
Every physician, regardless of specialty or type of practice, depends in some degree upon the healing of wounds for the ultimate survival of his patient. The healing of wounds plays a vital role in the practice of medicine, and beyond that, in the survival of the species. It is the obligation of every physician, and more especially to those of us who create surgical wounds, to assist rather than retard the normal healing process. This monograph by Dr. Hartwell provides basic information to be used by all of us.

In a clear, concise manner the author presents his own observations on human wound healing and emphasizes the differences between data collected from animal experiments and those few observations that have been made in human surgical wounds. The author divides wound healing into two separate processes, epithelial and sub-epithelial healing, distinctly different but interdependent. Without boring the reader, a cell by cell description of these two healing activities is given and the practical applications of these microscopic observations are clearly outlined. During the brief time required for the reading of these 150 pages, the reader will begin to appreciate the skin as a functioning organ and not merely a haphazard envelope for the body. In the chapter, the author gives a layer by layer description of the healing process as it involves a typical abdominal incision, and provides a sound physiologic basis for the repair of surgical wounds with regard to fibrous healing and the functional stress applied to the wound.

It is not often that a book can be recommended to every physician, but occasionally information of a fundamental nature becomes available and should be acquired by every practitioner of the healing art. This monograph would appear to fit those qualifications and the reviewer urges every physician to avail himself of the facts and observations presented in such a readable manner by Dr. Hartwell.

J.V.T.

PRIMER OF ELECTROCARDIOGRAPHY. Third Edition. George E. Burch, M.D., Henderson Professor of Medicine, Tulane University School of Medicine; Physician-in-Chief, Tulane Unit, Charity Hospital; Consultant in Cardiovascular Diseases, Ochsner Clinic, Ochsner Foundation Hospital, Veterans Administration Hospital; Visiting Physician, Touro Infirmary; Consultant in Medicine, Hotel Dieu, and Illinois Central Hospitals, New Orleans, Louisiana; and Travis Winsor, M.D., Assistant Clinical Professor of Medicine, University of Southern California Medical School; Director, Nash Cardiovascular Foundation, Hospital of the Good Samaritan; Junior Attending



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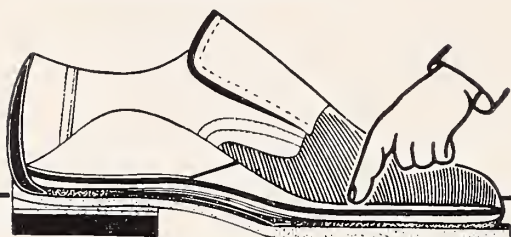
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Physician, Los Angeles County Hospital; Junior Attending Physician and Diplomate, Children's Hospital Cardiac Department, Los Angeles, California. Price \$5.00. 286 pages, illus., cloth. Philadelphia: Lea Febiger, 1955.

To review a book on electrocardiography one ought to know his physics and his physiology. The reviewer claims very little resemblance to a physicist; he does know some physiology.

As a clinician I started reading electrocardiography on the machine made by Hindle (now Cambridge). It resembled a modern electrocardiograph less than an old Ford resembles a modern automobile. With this machine and a few articles on electrocardiography I stumbled along. Sir Thomas Lewis' book "The Mechanism and Graphic Regulation of the Heart" came out about the same time. That helped a great deal. Then Pardee's book came out in 1924. After that I used Pardee's book as a guide and source of information. Then Ashman and Hull's book came out in 1937 followed by Burch and Winsor's Primer in 1945. The Primer has been my guide through the years. Comparing the 1945 edition with the most recent one in 1955 there is nothing new added to it. The format, however, is such better

To me, the application of Victor and Spatiel electrocardiography are still in the experimental phases. The ventricular gradient may be of some practical purpose. The time consuming features of the just enumerated studies of electrocardiography are such that when the question arises it can be referred to the laboratories of the initiators.

The third edition of "A Primer of Electrocardiography" by Burch and Winsor can be highly recommended to the student who is just beginning and also to the clinician who feels the need of refreshing his knowledge of the fundamentals.

Personally this book is not a primer; to me it is a text which I consult frequently.

H.L.U.



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AMERICAN CANCER SOCIETY BOOKLET AVAILABLE

The American Cancer Society is making distribution nationally to doctors of a booklet titled "The Physician and the American Cancer Society." Purpose of the presentation is to show the scope of the Society's overall program in relation to the professional aspects heretofore treated separately in other ACS publications. The work which supplements the well-known ACS Monograph series, is being sent to the entire membership of the American Medical Association, to interns, residents and senior medical students. Total distribution will run to about 250,000.

The booklet contains thirty-two pages, with two-color cover, and is generously illustrated. It treats with the Society's involvement in research and outlines service to patients, as well as its public and professional education programs. It gives a capsule history of the Society, its organizational philosophy, its guiding principles. Also provided is a listing of ACS publications and materials of special interest to doctors, and the addresses of the sixty ACS Divisions where they may be obtained.

Original Contributions

Sarcoidosis

Report of Eighteen Cases

JOSIAH FULLER, M.D.
FRANK J. HIRSCHBOECK, M.D.
Duluth, Minnesota

BOECK'S sarcoid, long felt to be primarily a skin disorder, has been known to involve any organ or tissue. Since lesions demonstrated on chest roentgenograms are being more accurately investigated, it is becoming apparent that the systemic form of the disease is actually more common. As the disease is of unknown etiology, since there is debate about the nature of the pathologic process and since there is disagreement about the prognosis of the condition, we believe that an effort should be made to report groups of cases that have been subjected to clinical and laboratory observation. The following is a report of eighteen patients who have been studied at the Duluth Clinic.

These patients have been followed from one month to six years with an average period of observation of twenty-two months. The average age of the group was forty-four years, with a range of twenty-six to sixty-five years. Seven of these patients were men.

Table I is a list of the clinical manifestations in these eighteen patients. Cough, enlarged peripheral lymph nodes and chest pains were the most common complaints. One of the five patients had lost seventy pounds. One of the five patients with arthritis had rheumatoid spondylitis and the rest had episodes of acutely painful swollen joints resembling in many respects the joint involvement of erythema nodosum.

Some of the more uncommon manifestations were interesting. The patient with fatigue presented himself to his physician for investigation of a chief complaint of fatigue. Peripheral neuritis involved the sixth, seventh, and eighth cranial nerves in a woman aged thirty-seven. Spontan-

eous pneumothorax occurred in a woman with very considerable pulmonary fibrosis. Three patients had erythema nodosum. Lofgren¹ has concluded that this indicates a primary stage of the sarcoidosis.

TABLE I. BOECK'S SARGOID

Clinical Manifestations—Eighteen Patients

Cough	8
Peripheral nodes	8
Chest pain	7
Weight loss	5
Arthritis	5
Dyspnea	5
Iritis	4
Abdominal pain	4
Erythema nodosum	3
Fever	2
Skin lesions	2
Fatigue	1
Parotid inflammation	1
Peripheral neuritis	1
Spontaneous pneumothorax	1
No symptoms	0

It should be noted that none of the patients was asymptomatic. Sarcoidosis is rarely an incidental finding in an individual who feels well, yet physical findings often outweigh symptomatic evidences.

The results of some of the laboratory tests were worth noting. A tuberculin skin test was done on sixteen patients and was negative in all except one who is negative to 0.1 mg. old tuberculin but positive to 1 mg. The erythrocytic sedimentation rate was elevated in thirteen of the fifteen patients for whom it was measured. The proteins were studied in eleven patients. The total serum proteins were above normal range in six patients averaging 8.6 grams per cent. The serum globulin was elevated in four, averaging 3.9 grams per cent and the albumin in two patients averaging 5.9 grams per cent. However, we did not consider this slight change in the proteins to be significant.

Presented at a meeting of the Minnesota Academy of Medicine, April 11, 1956.
From the Department of Thoracic Surgery and Internal Medicine, The Duluth Clinic.

Chest roentgenograms were made in all eighteen of these people with Boeck's sarcoid. In order to summarize the findings, the patients have been placed in groups according to the appearance of their roentgenograms. Figure 1 is an example of enlargement of the hilus and mediastinal lymph nodes without pulmonary parenchymal involvement. Seven of these eighteen patients had roentgenograms that resembled Figure 1.

Figure 2 is an illustration of an x-ray appearance that we have termed coarsely nodular and reticular. Note the small spontaneous pneumothorax. The nodules in the pulmonary parenchyma are gross and the reticulated appearance is in the form of a coarse network. These same findings were present in five patients, in contrast with the appearance of the film shown in Figure 3. This we have termed finely nodular and reticular. The nodules are so small they could be called military, yet close observation will disclose a reticulated pattern in the infiltrate. This was found at some time in three patients in this series.

For lack of a better term we have called the x-ray findings represented by Figure 4 "soft fluff." Four of these patients had radiographic findings that resembled this picture. In only one of the eighteen patients was the x-ray examination negative during the entire period of observation.

Serial chest roentgenograms on patients with pulmonary or mediastinal changes due to Boeck's sarcoid are characterized by their instability. In two of our patients the hilar lymph nodes regressed as the parenchymal changes appeared. This has been noted previously by Lofgren.² There was no change in the x-ray findings in six patients during the period of observation, and in four patients who showed changes the most recent chest films are now negative. There is definite improvement in the radiograms in three patients and in six of them the condition is worse.

X-ray examination of the hands was made in five patients and was negative in all.

All of these eighteen patients had histologic examination of tissue that was interpreted as being consistent with Boeck's sarcoid. In each case the tissue showed epithelioid cell granulomas without caseation. According to Siltzbach,³ the hard tubercle may also be found in tuberculosis, leprosy, histoplasmosis, berylliosis and brucellosis. However, when a typical clinical picture is com-

bined with the histologic appearance of noncaseating granuloma that exhibits a peculiar uniformity of stage of development in each tubercle, it is safe to make a diagnosis of Boeck's sarcoid. Furthermore, we send a portion of the excised tissue to the laboratory separately in a sterile container so that it may be cultured for bacterial pathogens, acid-fast bacilli and fungi.

In sixteen patients the scalene or cervical lymph nodes were the source for the biopsy material. In two cases a liver biopsy showed the characteristic histologic picture, and the bone marrow, skin, and hilus lymph nodes each showed a positive biopsy on one occasion. It will be noted in Table I that only eight patients had palpable peripheral lymph nodes yet we obtained positive lymph node biopsies in sixteen of the patients. Even in the absence of palpable lymph nodes, it is often possible in the presence of Boeck's sarcoid to obtain a positive biopsy by excising the fat pad with contained lymph nodes that lie on the anterior surface of the scalenus anticus muscle. This method, useful in diagnosing many obscure intrathoracic diseases, was described by Daniels⁴ and has been modified by others.⁵⁻⁹

We endeavor to keep the operation simple and do most of them under local procaine hydrochloride infiltration anesthesia in a manner similar to that described by Daniels. An incision is made parallel to and 1 cm. above the clavicle, extending laterally from the medial border of the clavicular head of the sternocleidomastoid muscle almost to the edge of the trapezius muscle. The dissection is carried below the omohyoid muscle. The fat pad and contained lymph nodes lying on the scalenus anticus muscle is removed *in toto*. The carotid sheath, subclavian artery and vein, pleural cap and brachial plexus border in the field of operation and the phrenic nerve, transverse scapular and deep transverse cervical artery and thoracic duct are frequently encountered in the dissection.

Anatomic investigations⁵ have shown that in most cases it is best to explore the right scalene area since the lymphatics from the right lung and the lower portion of the left lung drain to the right side.

Eight of our patients have received cortisone. Three of them received the drug more or less empirically elsewhere before the diagnosis was made. At the Duluth Clinic we reserve cortisone

for the patients with serious extra-pulmonary involvement or progressive symptomatic pulmonary disease. There can be no question that it has been of very material benefit in the five

symptoms which are not considered disabling and three of them are suffering from an appreciable disability. Although the number of patients in this series is much too small to draw any conclu-



Fig. 1. (*Left, above*) Boeck's sarcoid—hilus and mediastinal lymph node enlargement only.

Fig. 2. (*Right, above*) Boeck's sarcoid—coarsely nodular and reticular.

Fig. 3. (*Left, below*) Boeck's sarcoid—finely nodular and reticular.

Fig. 4. (*Right, below*) Boeck's sarcoid—"soft fluff."

patients to whom it was given for treatment of diagnosed Boeck's sarcoid, although there must be a careful check for possible untoward developments.

The prognosis of sarcoid as recorded in the literature varies all the way from the 19 to 25 per cent mortality described by Riley¹⁰ and Reisner¹¹ to the report of Carr and Gage¹² who concluded, after studying 194 patients, that the five-year survival rate of patients with sarcoidosis was 92.9 per cent, while that of a similar normal population was 99.5 per cent.

None of our eighteen patients has died. Seven of them are completely asymptomatic. Eight have

sions of statistical significance, it is interesting that all of the patients in the disabled group complained of cough and dyspnea and had a chest roentgenogram that appeared coarsely nodular and reticular, whereas only one of the patients who eventually became asymptomatic ever complained of dyspnea or had these x-ray findings, and only two of them had a cough.

We believe it is best to be optimistic when discussing the future with most patients with Boeck's sarcoid, unless they have severe and persistent disabling symptoms.

(Continued on Page 151)

Pheochromocytoma

Report of Two Cases

J. ALLEN WILSON, M.D.
Saint Paul, Minnesota

PHEOCHROMOCYTOMAS are tumors formed from primitive cells derived from the neural crest. They may occur in the adrenal medulla or at other locations within the sympathetic nervous system. In a series of 139 cases, the tumors were located as follows:

Right adrenal.....	72
Left adrenal.....	44
Both adrenals.....	13
Intra-thoracic	4
Intra-cerebral	1
Right aortic ganglion.....	2
Left aortic ganglion.....	2
Zuckerkandl's ganglion (at bifurcation of aorta).....	2

These tumors may consist only of small focal enlargements in the adrenal medulla or become as heavy as 3,197 grams. The outer border of the smaller tumors is composed of adrenal cortex. The outer surface of the tumor varies in appearance from a pale gray or pink to a dusky brown. Cross section often shows evidence of necrosis and cystic formation. The microscopic appearance varies considerably. Most are benign but about 8 per cent of the tumors so far reported have been malignant. Marked pleomorphism may be found even in benign tumors; hence, a diagnosis of malignancy cannot be made on the basis of the microscopic picture but rather by the presence of local or capsular invasion or distant metastasis. The tumor tissue must give a positive chomaffin reaction before a diagnosis can be made. This reaction is produced by treating the tumor tissue with a chromatic solution, resulting in a brown stain in the cytoplasm of some of the cells.

Clinically, pheochromocytomas manifest themselves in one of four ways: (1) With paroxysmal hypertension (adrenal-sympathetic syndrome); (2) with persistent hypertension mimicking essential or malignant hypertension; (3) with a combination of hypertension, hypermetabolism and

glycosuria; and (4) with persistent hypermetabolism or hyperglycemia coexistent with intermittent hypertension. Goldenberg and associates³ stated that if tumors of the adrenal medulla functioned in the manner of the normal medulla, resting secretion would be negligible, and a discharge of epinephrine or norepinephrine would occur only upon physiologic stimulation (such as by acetylcholine or histamine). This is true in about a quarter to a third of the cases studied. The resulting clinical picture is that of paroxysms (adrenal-sympathetic syndrome) similar in manifestations to the effects of a rapid intravenous injection of a pharmacologic dose of epinephrine or norepinephrine or both. The chief features of such an attack are a steep rise in blood pressure associated with pallor, tachycardia, precordial and upper abdominal pain, hyperglycemia and anxiety, all or some of which may last for a few minutes to several hours. The attack usually then subsides but occasionally leads to fatal pulmonary edema or ventricular fibrillation.

Observations on cases in which paroxysmal hypertension occurs with persistent hypermetabolism or persistent hyperglycemia suggest that the "resting" secretion of these tumors may not be negligible although insufficient to produce elevated blood pressure. Apparently the metabolic effects are caused by much smaller doses of epinephrine than are needed to produce hypertension.

More often the tumors produce persistent hypertension associated with continuous secretion of epinephrine or norepinephrine or both. Small tumors, containing norepinephrine predominantly but not more than a total of 80 milligrams of this chemical, give rise to a syndrome resembling essential hypertension not accompanied by striking metabolic features. In patients with tumors containing larger total amounts of norepinephrine, hypermetabolism and hyperglycemia are more marked even though norepinephrine produces the

Inaugural thesis presented before the Minnesota Academy of Medicine, November 9, 1955.

atter to a much lesser degree than does an equal amount of epinephrine. When epinephrine is the predominant catecholamine in the tumor, hypertension, hypermetabolism, hyperglycemia and tachycardia are all prominent clinical manifestations.

In about 10 per cent of cases of tumors containing a large amount of epinephrine with a clinical picture of essential hypertension, with normal heart rate, and absence of metabolic disturbance, a negative or equivocal response to benzodioxane may be obtained. This suggests that persistent hypertension in patients with pheochromocytoma is not invariably due to the presence in the circulation of sufficient epinephrine or norepinephrine to cause hypertension by direct cardiovascular action (such as it does in acute infusion experiments). This nonhumoral hypertension in some cases of pheochromocytoma limits the value of adrenergic blocking agents in the diagnosis of the disease and makes desirable a direct diagnostic method not depending on a variable pharmacologic response. Hence Goldenberg and co-workers began to work on a method for measuring the increased urinary output of these catecholamines.

Pheochromocytomas may be diagnosed first at autopsy (fifteen such cases were reported from one institution),⁸ but it is unusual for these deaths to be unrelated to the tumor. Of these fifteen deaths, twelve were due directly or indirectly to the tumor. Five of these patients died after operations for some other condition, some of which were relatively minor surgical procedures. This emphasizes the fact that pheochromocytomas render a patient especially susceptible to surgical shock. A pressor response is produced by anesthesia, and if such a response occurs the procedure should be postponed, if possible, until the cause can be ascertained. The usual causes of death in those cases diagnosed at autopsy are related to cardiovascular degeneration, which results in acute left ventricular failure, cerebrovascular accidents and chronic congestive failure.

Early reports indicated that paroxysmal hypertension was more frequent than persistent hypertension. This has been found incorrect and now it is found that about 70 per cent of the cases present as chronic or persistent hypertension.¹⁴ Probably most of the patients with functioning pheochromocytomas will progress to persistent hypertension if they live long enough. Paroxysmal attacks of adrenal-sympathetic syndrome may be su-

perimposed on persistent hypertension. It must be remembered that paroxysmal hypertension may be also a manifestation of other diseases than pheochromocytoma, such as eclampsia, lead poisoning, essential hypertension, nephritis, traumatic or vascular brain damage, or tabes dorsalis. These paroxysmal attacks in cases of pheochromocytoma tend to increase in frequency and severity as time elapses. They may be produced by emotional stress, change in body position, exertion, exposure to cold or massage of the abdomen. At times, a provoking mechanism cannot be determined.

The presence of an elevated basal metabolic rate or of hyperglycemia associated with hypertension should make one aware of the possibility of the patient's having a pheochromocytoma. These tumors may also cause some swelling of the thyroid gland, exophthalmus and an increased protein-bound iodine, and the BMR may temporarily be lowered by antithyroid drugs.¹⁶ The hypermetabolism may be present during the normotensive period between paroxysms of hypertension, but is most often seen in patients with persistent hypertension. In one series of eleven persons with persistent hypertension, ten had a BMR over 10 per cent and the average was +49 per cent. In the same report, only three patients of a group of fourteen with paroxysmal hypertension showed hypermetabolism.¹⁰ Several other reports mention the importance of hypermetabolism in hypertension.^{1,3,11,16,17} Hyperglycemia is of less frequent occurrence in patients with pheochromocytoma, but its occurrence in conjunction with hypertension should arouse one's suspicion of the presence of this tumor.^{1,3,5,10,11,17} It is stated that at the time a diagnosis of pheochromocytoma is made, about 10 per cent of the patients are being treated for diabetes.¹⁶ Hyperglycemia may be either paroxysmal or persistent; whether or not it is persistent does not depend on whether or not the hypertension is persistent. Clinically, the diabetes is similar to diabetes mellitus in that acidosis may occur and there is a good response to insulin. The development of hyperglycemia in this disease is dependent on the glycolytic effect of epinephrine on the liver. However, acidosis in patients with pheochromocytoma is associated with a normal or slightly increased content of glycogen in the liver, in contrast to glycogen depletion in the liver in the acidosis of diabetes mellitus.^{5,17,22} The explanation of this occurrence in epinephrine diabetes lies in an increased breakdown of muscle

glycogen and the resulting lactic acid is transported to the liver where it is resynthesized to glycogen. The explanation for the occurrence of ketosis in epinephrine diabetes is not known but it is postulated to be the result of increased fat catabolism by the direct action of epinephrine.^{5,17}

The difference in the ratio of secretion of norepinephrine and epinephrine should not influence too greatly the clinical manifestations of the tumor, since sudden release of large amounts of epinephrine will cause increased peripheral resistance just as does norepinephrine, and sudden release of large amounts of norepinephrine will cause metabolic changes, just as does epinephrine. At the level at which these substances are used by the body, epinephrine causes decreased peripheral resistance and metabolic effects, while norepinephrine increases peripheral resistance and has little metabolic effect.

In the reported cases of pheochromocytoma, there is associated multiple neurofibromatosis in about 5 per cent.¹¹ In a more recent report, the over-all incidence of an associated neurocutaneous syndrome is approximately 10 per cent.⁶ This syndrome includes multiple neurofibromatosis, von Hippel-Lindau disease, tuberous sclerosis, and the Sturge-Weber syndrome. The association with neurofibromatosis is certainly more than chance and this may also be true in the case of von Hippel-Lindau disease. So far there are no reports of the occurrence of pheochromocytoma in patients with tuberous sclerosis or the Sturge-Weber syndrome. There is a tendency for pheochromocytoma to be familial, and the familial nature of the diseases making up the neurocutaneous syndrome is well known. Long-term follow-up of patients with pheochromocytoma, when available, will determine whether more of these persons will show manifestations of the neurocutaneous syndrome at a later date. Neurofibromatosis of the intercostal nerves may produce bilaterally symmetrical notching of the ribs similar to that seen in coarctation of the aorta. If such notching is seen in a patient with hypertension who does not have coarctation of the aorta, the possibility of neurofibromatosis and pheochromocytoma should be suspected.⁶ Unusual manifestations of this tumor also include gastrointestinal hemorrhage¹⁰ and one case of an abscess caused by *Salmonella typhimurium* in a functioning tumor.⁹

The diagnostic methods used to establish the presence or location of a pheochromocytoma have

been of three main types, namely roentgenologic studies, pharmacologic tests and chemical examination of the blood and urine. At times massage of the abdomen has resulted in a strong pressor response but failure to obtain this response does not exclude the diagnosis of this tumor. A palpable tumor is rarely found. In one series of twenty-five patients, only two had a palpable mass and both tumors proved to be malignant lesions.

X-ray methods of diagnosis include (1) a flat plate of the abdomen, which is rarely of much help since the tumors are of low density;¹¹ (2) renal pyelography, which may show displacement or distortion of the renal shadow; (3) aortograms; (4) planigraphy of the renal areas; (5) perirenal injection of air; and (6) presacral injection of oxygen. Perirenal injection of air has largely been abandoned as being too hazardous, and presacral injection of oxygen may well also be regarded as a dangerous procedure, as evidenced by a report of three fatalities and two near fatalities secondary to this procedure.⁷ The two near fatalities presented the typical "millwheel" murmur of intracardiac air. Kvale, Priestley and Roth¹⁰ stated that localization of the site of the tumor by the above methods is not necessary, since bilateral exploration of the adrenal areas is now carried out at operation. Intrathoracic pheochromocytomas have all been visible on ordinary chest x-rays.

Pharmacologic tests for this tumor are divided into: (1) use of drugs that provoke a pressor attack by the release of pressor substances from the tumor and (2) use of adrenolytic substances that antagonize or inactivate pressor substances, thereby lowering the blood pressure. Usually the first group of tests is used if the blood pressure is below 170 mm. systolic and 110 mm. diastolic, and the second group of tests is used if the blood pressure is above this level. For the correct interpretation of these tests, the patient must have had no sedative drugs for twenty-four hours. Administration of the shorter acting antihypertensive drugs must be stopped on the previous day. Use of thiocyanates must have been discontinued for four to six days. No specific statement could be found about the effect of rauwolfia products on the tests. This drug is said to have a persistent effect for several weeks after its administration has been discontinued.

The pressor provocative drugs are histamine,²⁰ mecholyl bromide²³ and tetraethyl ammonium

chloride.²⁴ Of these, histamine is the most reliable, and the others are now seldom used. After basal conditions are established, 0.025 to 0.05 mg. of histamine base in about 0.5 cc. normal saline solution is injected rapidly intravenously. A positive test is indicated by an initial fall of blood pressure (which also occurs in normal subjects) followed by a marked pressor response (often a rise of over 100 mm. of mercury). As the test was first used, a positive test was one in which the blood pressure rose higher than it did on a previously performed cold pressor test. The latter test has been eliminated since a cold pressor test itself may provoke a hypertensive effect in a patient with a pheochromocytoma. It is agreed that the histamine test is a fairly reliable one, but some false negative and false positive tests have been recorded.^{1-3,11} Proof that a pressor response to the histamine test is actually the result of a release of pressor amines into the blood stream has recently been afforded with the finding that blood levels of pressor amines increase when a pressor response is produced.¹⁵ The method by which histamine produces this effect has been suggested to be the result of blood vessel dilatation in the tumor or perhaps a direct stimulating effect similar to that on the chief cells of the stomach.²

The two adrenolytic substances used in diagnosis of pheochromocytoma are benzodioxane and Regitine. Dibenamine, also once used, has been abandoned because of its side effects and because it also produces hypotension in the absence of pheochromocytoma. During the depressor state produced by dibenamine, which may last twenty-four to forty-eight hours, the blood pressure may not respond to pressor substances.¹¹

Benzodioxane was first reported to be a valuable adrenolytic agent in 1947.¹⁹ In the dose subsequently determined, benzodioxane was found to be adrenolytic only and not sympatholytic. The technique of the test calls for the intravenous administration of 10 mg. of benzodioxane per square meter of body surface, or 0.25 mg. per kg. body weight. The injection should require two minutes. A positive result is indicated by a sharp drop in both the systolic and diastolic blood pressure within one to two minutes. Most (97 per cent) of the cases of essential hypertension will show a rise of blood pressure during the test.¹² This rise may be preceded by a slight fall in pressure. Side effects include tachycardia, apprehension, clammy

extremities and occasionally an alarming pressor response. The separation of a positive from a negative test is almost always clear-cut. When properly performed, the benzodioxane test showed four false negative tests in seventy-two proven cases of pheochromocytoma and one persistently false positive in ninety-one cases of essential hypertension.³ Higher percentages of false negative tests are obtained by prolonging the injection period over two minutes. For routine testing, Regitine is preferred, but positive Regitine tests should be confirmed with the benzodioxane test. If a negative Regitine test is obtained when clinical suspicion of the existence of a pheochromocytoma is strong, the benzodioxane test should also be done.

The Regitine test was first used in 1949.¹⁸ The test is carried out by rapidly injecting 5 mg. of the drug intravenously after the blood pressure had reached a basal level, and determining blood pressure at thirty-second intervals for three minutes and then at one-minute intervals for seven more minutes. A positive test is indicated by a drop in systolic pressure of over 35 mm. Hg. and a drop in diastolic pressure of greater than 25 mm. Hg. with the maximum drop occurring within the first two minutes after the injection.¹² Using these criteria there are many borderline responses and many false positive tests. In one series of tests on 107 hypertensives there were four false positive tests¹² and in another series of ninety-one hypertensives, eight false positives.³ False negative responses have been reported and probably occur with about the same incidence as with benzodioxane.³ In the presence of uremia the Regitine test is unreliable, often giving a false positive result.

Because of the false negative and false positive tests using histamine, benzodioxane and Regitine, several workers have sought to determine catecholamine levels in the plasma and urine, thus hoping to provide more reliable means of diagnosis of pheochromocytoma. The crudest attempt to demonstrate the increased production of pressor amines in patients with this tumor has been the injection of 1 cc. of the patient's untreated urine intravenously into the vein of an anesthetized dog (Weiman, Back, Russo, Shoemaker and Wolf).²⁵ In several cases, this resulted in a prompt pressor effect of up to 60 to 70 mm. Hg. systolic blood pressure. After surgery in one case, injection into a dog's vein of 10 cc. of an

alcohol extract of 49 grams of the tumor produced a marked blood pressure elevation similar to that produced by 0.25 cc. of 1:1000 norepinephrine. In one of the patients whom I am reporting, the injection of 1 cc. and 2 cc. of the patient's urine did not produce any demonstrable pressor effect in a dog.

In much more refined chemical analyses of catecholamine levels in the urine, Goldenberg and his co-workers³ recently have described their studies in sixteen cases of pheochromocytoma, ninety-one cases of essential hypertension, thirteen normotensive healthy subjects, ten cases of Addison's disease and fourteen cases of essential hypertension following lumbar sympathectomy. The methods they used consisted in part of adsorption of the urinary catecholamines on precipitated aluminum hydroxide followed by elution, desalting, and concentration in vacuo. These extracts were studied by bioassay, paper chromatography, photofluorometric evaluation and absolute quantitation of norepinephrine and epinephrine by chemical methods. They concluded that photofluorometric evaluation of extracts of urine seems to constitute the most reliable test for pheochromocytoma. They devised a short screening method but found that any positive result using this screening method must be confirmed by the longer procedure. No false negative or false positive results were obtained by the longer method. These authors found that in patients with pheochromocytoma the urinary excretion of norepinephrine and epinephrine has been found consistently to be far in excess of the amounts excreted by normotensive and essential hypertension subjects. The quantities of these amines secreted in the urine represent only a small fraction of the total amounts secreted by the tumor. The fact that the catecholamine mixture of human urine, if tested by bioassay methods consists predominantly of norepinephrine and less than 15 per cent of epinephrine, suggests that its primary source is the sympathetic nervous system rather than the adrenal medulla. This assumption is easily proved, they say, for in Addison's disease the urinary excretion measured by bioassay as norepinephrine equivalent may be within normal limits. The lowest excretion rates were found in fifteen cases of essential hypertension following thoracolumbar sympathectomy. The authors found the urinary measurement of norepinephrine and epinephrine valuable for both

persistent and paroxysmal hypertension due to pheochromocytoma. A most surprising finding was the amount of "leakage" of catecholamines encountered in paroxysmal cases during the normotensive periods between attacks. To account for the lack of a pressor response to the relatively large amounts of norepinephrine secreted by some of the tumors between attacks, the authors felt tempted to speculate that an adrenergic blocking agent may have been secreted.

Another attempt at more accurate diagnosis of pheochromocytoma has been the venous plasma determinations of norepinephrine and epinephrine by Manger and his associates¹⁵ in thirteen patients with pheochromocytoma. Their method involved paper chromatography followed by elution and fluorometric quantitation of the pressor amines. In all their patients with sustained hypertension the preoperative levels of epinephrine and norepinephrine were significantly elevated. Two of their four patients with paroxysmal hypertension due to this tumor had elevated plasma levels of these pressor amines. The concentration of epinephrine and norepinephrine in the other two patients could be significantly increased by use of a provocative drug like histamine. The use of an anesthetic or palpation of the tumor in the abdomen was often associated with the release of considerable amounts of these catecholamines. They also found norepinephrine to be the major substance of these amines secreted in increased amounts.

In considering the use of determinations of pressor amines in the urine and plasma, it would appear that quantitation of urinary epinephrine and norepinephrine is apt to be more valuable. It has an advantage of measuring the result of secretion over long periods of time while measurements of the pressor amines in the blood reveal only what is present at the moment.

The treatment of pheochromocytoma is always surgical, once the diagnosis has been made. The abdominal approach is now used to facilitate exploration of both sides. At the time of anesthesia and during the entire surgical procedure (especially during manipulation of the tumor), a solution of Regitine should be at hand and 5 mg. of the drug should be administered intravenously at any time that the blood pressure tends to rise to dangerous levels. After removal of the tumor a constant infusion of 4 mg. of Levo-phed per liter of isotonic saline should be started and adjusted to

keep the blood pressure at normal levels.^{10,11} This is more apt to be necessary in patients who have had persistent hypertension rather than in the paroxysmal type prior to surgery. A precipitous fall of blood pressure usually occurs in the persistent hypertensives with the removal of the tumor. If this does not occur, one should suspect the presence of a second tumor. The Levophed support of blood pressure may be needed for from one to three days after surgery. If bilateral tumors are found, the surgeon can usually leave some adrenal cortex but intravenous hydrocortone should be available at surgery to treat possible adrenal cortical insufficiency. In a group of twenty-five cases recently reported,¹⁰ there was no operative mortality. Before the patient is discharged a histamine provocative test should be done.

Surgical cures have been the rule, except in patients having malignant tumors. In a group of twenty-three cases followed two to seven years postoperatively it was found in every case that the patient was cured of his symptoms.¹⁰ Even the patients who had group 3 or 4 hypertension before surgery were found to have normal or near-normal blood pressures and the ocular fundi changes had reverted to normal or near-normal.

The two cases of pheochromocytoma reported below were diagnosed at the Minneapolis Veterans Hospital. One patient with paroxysmal hypertension was diagnosed by the author, and the patient with persistent hypertension was seen on another medical ward and the diagnosis established by a very able resident, Dr. Vernon Vix. Both patients were treated surgically with success.

Case Reports

Case 1 (Paroxysmal Hypertension).—J. G. A., a twenty-seven-year-old man, was admitted to the hospital on April 1, 1948. His complaints were attacks of palpitation, nervousness and fatigue for five years beginning while on military service in the South Pacific. The attacks of palpitation, flushing and extreme nervousness would last from a minute to ten minutes. They seemed to be precipitated by fatigue. He was seen by many Army physicians who noted only mild hypertension except on one occasion when the blood pressure was recorded as 225/140 during an attack. Gradually the attacks became more frequent and were accompanied by pain in the precordium, posterior cervical and left orbital areas. He felt well between attacks. A typical seizure was described as starting with palpitation, then flushing, then perspiration, then nausea and pain followed by nervousness and fatigue.

He had been admitted to this hospital in August, 1947, for operation of a fistula in ano. His blood pressure then had been recorded as 146/80. In March, 1948, he had been referred to the hospital by the out-patient clinic where his basal metabolic rate had been done at the request of a private physician. It was +85 per cent. He was admitted to the hospital with a tentative diagnosis of probable hyperthyroidism and anxiety state.

Physical Examination showed the patient to be extremely anxious and concerned about his condition. He feared he had a mental disorder. He had a marked increase in heart rate and forcefulness of beats when changing from a supine to a sitting position. His blood pressure was 150/100. The ocular fundi were normal and he had no exophthalmos.

Laboratory Findings: Routine blood and urine determinations were normal. Three BMR readings were normal. A glucose tolerance test was normal, as was a chest roentgenogram. An I-V urogram was reported as normal, but on retrospect a possible mass was noted over the upper pole of the left kidney. Perirenal air insufflation showed a distinct globular mass over the upper pole of the left kidney. An intravenous histamine tolerance test was done by injection of 0.05 mg. of histamine base. The blood pressure did not show an initial drop, but rose within three minutes from 150/90 to 235/100, falling back to the base level in ten minutes. A cold pressor test a few days later produced only a slight rise in blood pressure. A day or two later, the patient was observed during a spontaneous pressor attack. His blood pressure was found to be 220/110, and it gradually dropped to the base level within ten minutes. Intravenous injection of 100 mg. of Etamon failed to produce the drop in blood pressure usually seen when injected into the ordinary hypertensive patient.

A diagnosis of pheochromocytoma of the left adrenal area seemed most probable. The patient was submitted to surgical exploration. During manipulation of the tumor the blood pressure rose sharply to over 200 mm. Hg. systolic on three occasions. After removal of the tumor, the blood pressure dropped to 90/50. Much of the normal adrenal gland was left *in situ*. The blood pressure after removal of the tumor was controlled by a slow intravenous infusion of adrenalin solution. The tumor weighed 66 grams and measured 5 cm. in diameter. Microscopic examination confirmed it as a pheochromocytoma with no malignant cells seen. The cells were mostly of large polygonal shape with large hyperchromatic vesicular nuclei. The cytoplasm was abundant and acidophilic. A few spindle-shaped cells and some degenerative areas were seen. Postoperative convalescence was uneventful except for a temporary phlebitis in the right forearm and left leg. This was treated by rest, dicumarol, penicillin, and later by physiotherapy. His postoperative blood pressure averaged about 128/80. One week after surgery, the I-V histamine test was repeated. There was an immediate drop in blood pressure followed by a slight rise to 150/90.

The patient was discharged in excellent condition.

Case 2 (Persistent Hypertension).—H. H., a thirty-one-year-old white man, was admitted to the Minneapolis Veterans Administration Hospital on November 9, 1954. He had entered military service in World War II. In 1945, at the age of twenty-two, he had been rejected for officer-candidate training because of hypertension. After observation in an Army hospital he was returned to active duty. On discharge, from the service, he was given a 10 per cent disability rating for hypertension. He felt well and worked as an electrician until October, 1953. At that time he suffered a cerebrovascular accident involving the right side of his face, right arm and right leg, and loss of speech. These symptoms improved slowly during four months' hospitalization at the Fargo Veterans Administration Hospital. Since then he had been taking Rauvera tablets given by his own physician. He had frequent episodes of palpitation and throbbing frontal headaches especially when he was fatigued. These became severe about one month before admission. He had also noted some left flank discomfort. The patient's mother and sister were known to have hypertension.

Physical Examination revealed a pulse of 99 and blood pressure of 200 systolic and 130-110 diastolic. The ocular fundi presented Grade I hypertensive changes. The thyroid was not palpable. The precordium pulsed prominently. A grade III systolic murmur was heard in the left fourth interspace near the sternum. The blood pressure in the left leg was 220/140. No abdominal masses were palpated. Some residual weakness was noted in both right extremities and Hoffman and Babinski signs were noted. Mild facial muscle weakness was still present on the right.

Laboratory Findings: The hemoglobin measured 15.1 grams. Urinalysis showed a few white and red blood cells and a trace of albumen. The B.U.N. was 10 mg. per cent. A serologic test for syphilis was negative. The fasting blood sugar was 92 mg. per cent but a diabetic glucose tolerance curve was found. A P.S.P. test showed that 23 per cent of the dye appeared in the urine in fifteen minutes and 44 per cent in thirty minutes. Fluoroscopy and a P.A. roentgenogram of the thorax revealed no abnormalities. An I-V urogram was normal, except for a small calcific density in the right upper quadrant of the abdomen of unknown significance. Planigrams of both renal areas were normal. The BMR and EKG were normal. Radioactive iodine uptake by the thyroid gland was 24 per cent in twenty-four hours.

Hospital Course. One day after admission the resident physician, Dr. Vernon Vix, carried out a Regitine test. Five milligrams of this drug produced a drop in blood pressure from 210/126 to 144/90 in 100 seconds. Within ten minutes the blood pressure gradually rose to 186/116. Since the patient had been on antihypertensive drugs prior to admission, three more Regitine tests were carried out over the next three and one-half weeks while the patient was receiving no medication. These showed drops in blood pressure as follows: 200/108 to 124/74, 200/114 to 120/70, and 200/130 to 126/76. A Benodaine test was also done which produced a drop in blood pressure from 184/116 to 132/80. On November

22, one and two cc. of the patient's urine were injected intravenously into an anesthetized dog without any effect on the dog's blood pressure. At the time of the test the patient's blood pressure was only 146/100. The blood pressure was taken twice daily and fluctuated between 150/80 and 220/116.

The diagnosis was considered to be pheochromocytoma, so on December 22 an exploratory laparotomy was carried out. Cortisone was given preoperatively and for seven days postoperative. Both adrenals were explored. The left gland was normal. The right adrenal contained a tumor of 2 cm. diameter. The tumor with surrounding normal adrenal tissue was excised. During surgery the patient's systolic blood pressure fluctuated between 100 and 300 mm. Hg. Regitine solution was injected intravenously when the pressure rose steeply. Levo-phed or Aramine solution was injected during periods of hypotension to maintain a systolic pressure of around 170 mm. Hg. One pint of whole blood was given during the operation, blood loss being estimated at 250 cc. On the first postoperative day, the patient developed oliguria which lasted for ten days. The B.U.N. rose to a peak of 232 mg. per cent on the eleventh postoperative day. His potassium rose to a high of 5.15 Meq/L at that time. The serum amylase reached a high of 880 units per 100 cc. nine days after removal of the tumor. He was given the usual treatment for renal shutdown, including a Borst diet for a few days. The blood pressure stabilized at 150/100. At the time of discharge from the hospital the B.U.N. had returned to 20 mg. per cent and the patient felt well. Intravenous histamine was given during the postoperative period with no rise of blood pressure.

Pathologist's Report. The specimen weighed 11.8 gms. On section a thin rim of adrenal cortex was seen surrounding a tumor mass which occupied the entire medulla. It was of tan-gray color and rubbery consistency. A small amount of calcium was located in the middle of the tumor (corresponding to the calcific shadow seen on the intravenous urogram). At no point did the tumor penetrate the capsule formed by the adrenal cortex.

Microscopic examination of the tumor showed large cells having vesicular nuclei and of varied shapes (polyhedral, spindle or square). The cytoplasm was vacuolated and pink. Sections of the tumor fixed in bi-chromate solution showed many brown granules located in the cytoplasm of many of the cells. This was presumably an epinephrine-like substance. No evidence of malignancy of the tumor cells was noted.

Acknowledgment

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SARCOIDOSIS

(Continued from Page 143)

Summary and Conclusions

1. Eighteen patient with Boeck's sarcoid are presented who had histologic confirmation of the diagnosis and who were subjected to careful clinical and roentgenologic evaluation.

2. In our experience, sarcoid is a disease that frequently is overlooked because, though the patients have symptoms, they are not severe nor of a specific character. We feel that many cases are discovered when an awareness of its possible presence is in the mind of the physician. The illustrative cases seen by us, we feel, were quite definitive of sarcoidosis and no difficulty seemed to be encountered in classifying the disease state as such.

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The Value of Biopsy of Lower Deep Jugular (Scalene) Nodes as a Diagnostic Procedure

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MICROSCOPIC study of tissue is still the only absolute method of establishing a pathologic diagnosis in the presence of a tumor or other abnormal finding on clinical or roentgenologic examination. The historical aspects of removal of tissue for biopsy have been reviewed by Heinrich and Judd.¹ After positive diagnosis is made, the physician can better advise the patient regarding his condition and the therapy to be considered. For lesions which can be felt or seen, tissue for biopsy can usually be easily obtained as part of the planned surgical treatment of the disease. For instance, when a tumor of the breast is present, a specimen is easily removed for biopsy. If the tissue removed is malignant, a radical mastectomy can be carried out. If the results of the biopsy are negative with respect to a malignant lesion, a major surgical procedure is prevented. However, for certain intrathoracic or intra-abdominal lesions it is necessary to undertake a major surgical procedure if an absolute pathologic diagnosis is to be made. Considerable risk, discomfort and expense to the patient could be avoided if tissue could be obtained by a minor operation. In selected cases this problem has been solved by the removal of a lower deep jugular (scalene) node on the right or left side for study. The value of this procedure has been emphasized by Daniels² and others.³ The significance and value of removal of the sentinel node (Virchow's node) in the left lower cervical region is familiar to all physicians. Also, the significance of any abnormal lymphadenopathy should be recognized, especially in the presence of a known or suspected malignant lesion elsewhere in the body.

Read at the meeting of the Southern Minnesota Medical Association, New Ulm, Minnesota, September 10, 1956.

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The lower deep jugular nodes on the left are closely associated with the thoracic duct. Because of this, many intra-abdominal and left upper pulmonary and mediastinal lesions spread to these nodes. The lymph drainage from the remaining portion of the thorax is into the right lymphatic duct and to adjacent right lower deep jugular nodes. The lymphatic drainage from the thorax has been discussed by Connar.⁴ As he has illustrated, the lymphatic drainage of the right lung and the left lower lung field is to the right lymphatic duct, while that of the left upper lung field is to the thoracic duct. The left middle lung field is either to the thoracic duct or to the right lymphatic duct via the lymph nodes of the tracheal bifurcation. Lesions in the neck or the oral cavity usually spread to nodes in the ipsilateral side of the neck and occasionally first to the lower deep jugular nodes. Because of the more or less orderly spread of selected lesions, as mentioned previously, if a lower deep jugular node could be removed for biopsy, an absolute diagnosis might be established by a relatively simple surgical procedure and in some cases the necessity of a major operation might be eliminated.

Although the removal of a lower cervical node is a minor surgical procedure, it is a technical one because of the anatomic relations involved and should not be undertaken with a feeling of impunity. We prefer to do a precise anatomic dissection in exposing the nodes. A linear incision is made about 1 to 2 cm. above the clavicle and over the depression between the two heads of attachment of the sternocleidomastoid muscle (Fig. 1). A longitudinal split is made between these two portions of the muscle, and the internal jugular vein is exposed. The vein is freed along its lateral border and then retracted medially. The vagus nerve and the common carotid artery should be medial to the vein but occasionally will be deep to it. Care should be taken to determine the loca-

TABLE I. PATHOLOGIC DIAGNOSIS IN THIRTY-FOUR CASES IN WHICH NONPALPABLE LOWER CERVICAL NODES WERE REMOVED FOR BIOPSY*

Diagnosis	Right	Left	Total
Boeck's sarcoid	17	3	20
Tuberculous adenitis	2	0	2
Carcinoma of lung	3	3	6
Esophagus	1	0	1
Breast	0	1	1
Mediastinum	1	0	1
Hodgkin's disease	2	0	2
Parathyroid gland	0	1	1
Total	26	8	34

*A positive diagnosis was established in thirty-four cases in a series of seventy-nine in which biopsies were performed.

TABLE II. FINAL DIAGNOSIS IN FORTY-FIVE CASES IN WHICH BIOPSY OF NONPALPABLE CERVICAL NODES WAS NONCONTRIBUTORY

Diagnosis	Right	Left	Total
Indeterminate diagnosis	2	0	2
Indeterminate intrathoracic disease	12	3	15
Indeterminate pulmonary fibrosis	7	1	8
Boeck's sarcoid	3	0	3
Carcinoma of lung	8	2	10
Miscellaneous	5	2	7
Total	37	8	45

tion of these structures. In the deep area of the dissection the phrenic nerve should be seen on the scalenus anticus muscle. In the general area of the dissection, deep and lateral to the vein, the scalene fat pad containing multiple lymph nodes can be excised *en bloc*. When the dissection is carried out on the left, the thoracic duct should be kept in mind and protected.

In order to evaluate the removal of lower deep jugular nodes for biopsy as a diagnostic step, we have reviewed the case histories of 500 recent consecutive patients undergoing 503 surgical procedures. In seventy-nine instances there was no palpable lymphadenopathy and the procedure was carried out strictly as a diagnostic test, while in 424 instances clinically palpable nodes were present and removed for study. In the group of cases in which a node is not palpable, the procedure is considered to be a "blind biopsy."

Local anesthesia was used in 40 per cent of the cases, and no patient in this group required hospitalization. The remaining 60 per cent were given pentothal sodium, and these patients remained in the hospital one to three days. Many of these patients were already hospitalized because of their illness. Thirty-five per cent of the patients were female and 65 per cent were male. The ages ranged from eleven months to seventy-eight years.

There were no hospital deaths, and in only seven cases was there any significant morbidity; this was mainly bleeding, which was not serious in any case.

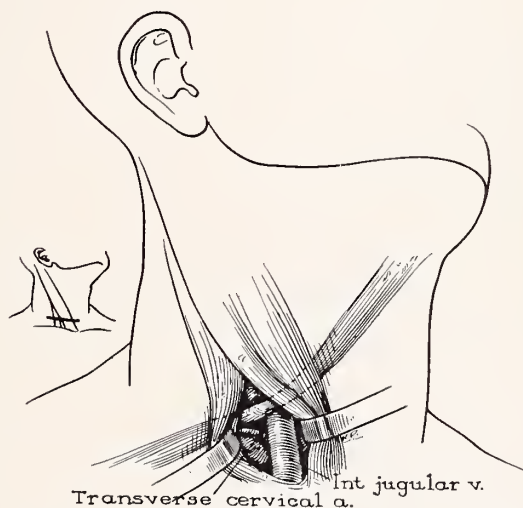


Fig. 1. The incision is situated over the depression between the two heads of the sternocleidomastoid muscle, and the dissection is carried deep and lateral to the internal jugular vein.

In 478 instances the biopsy was advised for diagnostic purposes, in twelve to aid in determining operability and in thirteen for diagnosis and to establish the operability of the primary lesion.

In thirty-four of the seventy-nine "blind biopsies" a positive pathologic diagnosis was established on study of the tissue, a diagnostic rate of 43 per cent (Table I). Study of the tissue in forty-five specimens was noncontributory in establishing a diagnosis. The final diagnoses in these cases are shown in Table II. Possibly had the blind biopsy been carried out on the right instead of on the left in eight of these instances, positive tissue could have been obtained, since the majority of thoracic lesions spread to the right. However, in the sixteen cases in which blind biopsy was carried out on the left, the intrathoracic lesions either were diffuse or were lateralized to the left.

Absolute diagnoses were established from 364 specimens of 424 removed from patients with palpable lower deep jugular nodes; this resulted in a diagnostic rate of 86 per cent (Table III). In sixty instances study of the nodes removed revealed no significant information toward establishment of a diagnosis. The final diagnoses in these cases, established by other measures, are shown in Table IV. In the group of 364 cases it is to be

TABLE III. PATHOLOGIC DIAGNOSIS IN 364 CASES IN WHICH PALPABLE LOWER CERVICAL NODES WERE REMOVED FOR BIOPSY*

Diagnosis	Right	Left	Total	Per Cent of 364 Cases
Boeck's sarcoid	18	15	33	9
Neck				
Lymphoma	12	19	31	8
Inflammatory lesion	14	8	22	6
Carcinoma	2	3	5	1
Thorax				
Carcinoma of lung	46	26	72	20
Lymphoma	19	20	39	11
Carcinoma of breast	8	22	30	8
Carcinoma of esophagus	3	8	11	3
Abdominal viscera				
Carcinoma	6	37	43	12
Lymphoma	1	2	3	1
Indeterminate carcinoma	23	42	65	18
Miscellaneous	1	9	10	3
Total	153	211	364	100

*A positive diagnosis was established in 364 cases in a series of 424 in which biopsies were performed.

noted that the majority of specimens were taken from the left side. This is the result of a large number of cases of primary lesions of intra-abdominal and undetermined origin in which the surgeon felt that the spread along the thoracic duct to the left lower cervical nodes might make a biopsy on the left side more likely to be diagnostic.

Comment

Boeck's sarcoid was the established diagnosis in twenty of thirty-four positive blind biopsies and in thirty-three of the palpable node biopsies. Certainly, if sarcoidosis is suspected clinically, whether or not there is palpable lymphadenopathy, biopsy of the lower jugular nodes would, in many cases, establish the diagnosis. As a rule, if no nodes can be felt and if the suspected lesion is not situated in the left side of the neck or in the left upper quadrant of the thorax, the right side should be the site of the operation. Blind biopsy has not been carried out frequently for suspected intra-abdominal lesions, but, if it is being done for this, then the left side should be explored.

When nodes were palpable, the primary lesion was situated in the neck in 16 per cent of the cases. This percentage may seem somewhat low, since cervical nodes are being removed, but few primary malignant lesions in the head and neck spread initially to the lower deep jugular nodes before declaring themselves clinically or developing metastatic lesions which can be detected clinically in the upper or middle or other groups of cervical lymph nodes. In fact, the nodes which we are discussing should probably not be considered primarily cervical nodes, since they are

TABLE IV. FINAL DIAGNOSIS IN SIXTY CASES IN WHICH BIOPSY OF PALPABLE CERVICAL NODES WAS NONCONTRIBUTORY

Diagnosis	Right	Left	Total
Indeterminate	9	9	18
Nonspecific adenopathy	9	6	15
Carcinoma of lung	3	6	9
Lymphoma	5	2	7
Miscellaneous	9	2	11
Total	35	25	60

terminal nodes for the lymph drainage of many areas of the body. The twenty-two specimens removed for biopsy and reported as inflammatory represent specific infections, such as tuberculosis, and not nonspecific inflammatory reactions, and because of this are considered positive biopsies.

Approximately 20 per cent of the palpable nodes removed established a diagnosis of carcinoma of the lung. In practically all of these patients a major thoracic operation was prevented, since spread to these nodes, as in the group of cases in which abdominal lesions were present, indicated that the carcinoma was beyond the confines of surgical removal, a point which has been made by Connor. The various cell types of carcinoma of the lung found in the seventy-two cases are shown in Table V. While squamous cell carcinoma represents about 40 per cent of all carcinomas of the lung, less than 20 per cent of the metastatically involved lymph nodes were of this type. Squamous cell carcinomas of the lung have been shown to spread to mediastinal lymph nodes less frequently than other types. Small cell carcinoma, representing only 10 per cent of all resected carcinomas of the lung, was found in 31 per cent of the node biopsies, and such a finding is in keeping with early metastasis to lymph nodes and a known poor prognosis.

Metastatic carcinoma of the breast was diagnosed in thirty cases. In all of these cases mastectomy had been performed previously and positive cervical nodes were evidence of metastatic spread of the original disease.

In 13 per cent of biopsies the primary lesion was found to be in the abdomen; forty-three were carcinomatous in type and three were lymphomatous. The various sites of primary carcinomatous lesions are shown in Table VI. Almost one half of the lesions were situated in the stomach. In the six instances in which the biopsy was carried out on the right side, either diffuse carcinomatosis was

TABLE V. CELL TYPE OF CARCINOMA OF THE LUNG IN PALPABLE CERVICAL NODES REMOVED FOR BIOPSY

Cell Type	Right	Left	Total
Small cell carcinoma	15	7	22
Adenocarcinoma	9	6	15
Squamous cell carcinoma	9	3	12
Undifferentiated carcinoma	5	7	12
Large cell carcinoma	7	3	10
Mixed adenocarcinoma and squamous cell carcinoma	1	0	1
Total	46	26	72

present or the lesion was situated in the upper portion of the stomach, involving the esophago-gastric junction.

In a large group of specimens, representing 18 per cent of the positive biopsies of palpable nodes, the type of carcinoma could not be identified or the primary site located. For the most part these lesions were highly undifferentiated carcinomas.

The bacteriologist plays a prominent role in increasing the value of the procedure of biopsy of lower deep jugular nodes. A portion of each specimen is placed by the surgeon in a sterile container. If the pathologist can make a positive diagnosis of neoplasm with the frozen sections, bacteriologic studies are not necessary. Likewise, if there is no evidence of specific inflammation, for instance, granulomatous or pyogenic reaction, culture studies have been shown to be of no value. If the frozen sections reveal a granulomatous reaction or other evidence of specific inflammation, the portion of the specimen in the sterile container is sent for bacteriologic studies. These may prove extremely valuable in the solution of certain difficult diagnostic problems. Heinrich and Judd¹ and Weed and Dahlin⁵ have similarly stressed this point.

It is apparent from the results of this study that biopsy of lower deep jugular nodes is a valuable diagnostic aid. The procedure certainly should be considered whenever a node in the lower cervical region is palpable and is thought to be abnormal. In selected cases of suspected intrathoracic lesions and in a few instances of intra-abdominal lesions, biopsy of a lower jugular (scalene) node should be considered even though no node is palpable clinically.

The indications for removal of a lower deep

TABLE VI. LOCATION OF PRIMARY CARCINOMA IN ABDOMEN ASSOCIATED WITH POSITIVE CERVICAL NODES

Site	Right	Left	Total
Stomach	6	14	20
Cervix	0	8	8
Prostate	0	3	3
Bladder	0	3	3
Colon	0	2	2
Kidneys	0	2	2
Ovary	0	2	2
Pancreas	0	1	1
Duodenum	0	1	1
Uterus	0	1	1
Total	6	37	43

jugular node for biopsy are as follows: (1) Lymphadenopathy or palpable nodes; (2) clinical or roentgenologic evidence or both suggesting (a) Boeck's sarcoid, (b) lymphoma, (c) malignant intrathoracic or abdominal lesions or (d) pulmonary inflammatory disease of granulomatous nature; and (3) to determine operability of intrathoracic or intra-abdominal malignant lesions.

Summary

Removal of lower deep jugular (cervical-scalene) nodes for biopsy in the presence of suspected intrathoracic or intra-abdominal lesions is considered a valuable diagnostic aid. Five hundred and three biopsies in 500 consecutive patients were evaluated. In seventy-nine instances in which the procedure was carried out in the absence of palpable nodes, the positive diagnostic rate was 43 per cent. In 424 biopsies in which abnormal nodes were palpable the diagnostic rate was 86 per cent. The operation is a technical but safe procedure and can be carried out with minimal morbidity and mortality.

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Relationship of Endometrial Hyperplasia to the Etiology of Adenocarcinoma of the Endometrium

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SCHRÖEDER'S¹ concept of persistent estrogenic stimulation unopposed by progesterone is generally accepted as the explanation of the etiology and of the histologic pattern of endometrial hyperplasia. This implies that hyperplasia is associated with the anovulatory type of cycle. The follicle or follicles not only fail to rupture, but continue to function beyond the usual ovulation period so that a persistent growth effect is produced upon the endometrium. Persistent estrogen from any other source will produce the disease. Exogenous estrogen will produce it in the castrate or after the menopause.

The factor which checks continued function of the follicles is believed to be an inhibition of the anterior pituitary gonadotropin formation with consequent withdrawal of the stimulus to follicle function and withdrawal of estrogen.² A bleeding phase results and this seems to be associated with lowered levels of estrogen excretion.

Following the menopause, this hormonal stimulation may arise from functioning ovarian tumors, namely, granulosa and theca-cell tumors. Hyperplasia, in the postmenopausal woman, may develop without an obvious source of estrogens. The estrogens in these cases may arise from the adrenals or from hypertrophic stromal cells near the ovarian hilum.^{3,4}

Authors engaged in serious studies of endometrial hyperplasia are not far apart in their views on the etiology or physiopathologic process of the disease. However, the clinical significance of hyperplasia, its relation to endometrial carcinoma and the proper safe treatment of the disease have been the source of much disagreement.

A study was undertaken at the University of Minnesota Hospitals to review our experiences with endometrial hyperplasia. One hundred and sixty-two cases of endometrial hyperplasia were treated at the hospitals during the ten-year period

from 1939 to 1949. The diagnosis was suspected in most cases by the bleeding history, but in every case was confirmed by microscopic examination of the endometrium after curettage. The late Dr. Robert Meyer and Dr. John L. McKelvey reviewed all of the pathologic specimens.

Twenty-six patients, or 16.1 per cent of those studied, had one or more repeat curettages for the same condition. All others who returned to the clinic with a recurrent abnormal bleeding story within a three-month period were given definite therapy for endometrial hyperplasia according to age and associated pelvic diseases without further diagnostic procedures.

The age distribution (Table I) is almost identical with that reported by Schröder in 3,270 cases studied over a forty-year period.⁵ The last years of the reproductive period (ages thirty-six to fifty-five) gave rise to 74.1 per cent (120) of all cases. The first years of reproductivity (ages ten to twenty) produced eleven (6.8 per cent) cases. There were ten (6.3 per cent) instances of hyperplasia between ages fifty-five and seventy-five.

In the Minnesota material there was associated pathology in sixty cases. Two women, ages fifty-one and fifty-six respectively, had granulosa-cell tumors. Thirty-seven (23 per cent) had myomata uteri and twenty-one (13 per cent) had endometrial polyps.

In the treatment of endometrial hyperplasia rather clear-cut principles were followed. No patient received treatment until the diagnosis was established microscopically.

In general, treatment in this series was conservative and surgical interference as a primary attack was avoided. In those below the age of forty, curettage, improvement of general constitutional status, rapid treatment of anemia and cyclic progesterone as advocated by McLennan⁶ and Holmstrom⁷, were used. After age forty, similar principles were applied although x-ray sterilization was more liberally used, particularly

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TABLE I. AGE DISTRIBUTION OF 162 CASES OF
ENDOMETRIAL HYPERPLASIA
1939-1949

Age	10-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-75	Totals
No.	16	7	9	19	31	49	21	5	5	162
%	9.9	4.3	5.6	11.7	19.1	30.2	13.0	3.1	3.1	100

in the presence of recurrence in the menopausal age group. The use of surgery was largely limited to those who had some associated pelvic disease.

During the ten-year period of this study, seventeen (10.5 per cent) were treated by hysterectomy. In each case, granulosa-cell tumors, prolapse or multiple or large myomata prompted the surgery.

X-ray sterilization was used in fifty (31 per cent) cases. Usually 600 to 700 tissue roentgens delivered diffusely to the pelvis at depth is an adequate dose to terminate ovarian function in a menopausal woman. X-ray sterilization is preferred to intrauterine radium because of the danger of infection, perforation and incomplete ovarian effect with the latter.

This conservative, nonsurgical approach to the handling of endometrial hyperplasia is obviously based on the conclusion that this condition is not a precancerous lesion and that x-ray irradiation in this dose does not give rise to malignancy. The present study is designed to test the reality of this.

Novak and Richardson⁸ consider atypical postmenopausal endometrial hyperplasia a premalignant condition. Novak and Yui⁹ feel that endometrial carcinoma and hyperplasia frequently coexist and reported the presence of endometrial hyperplasia in twenty-five of 104 cases of endometrial carcinoma. Arfwedson and Winbard¹⁰ report two cases of adenocarcinoma of the endometrium developing two years after radiotherapy for hyperplasia. Fremont-Smith et al¹¹ reported a patient who received estrogen therapy for eight years who developed, first, endometrial hyperplasia and then endometrial carcinoma. Hertig and Sommers¹² reported that cystic hyperplasia is a remote forerunner of endometrial carcinoma on the basis of reviewing the histologic material of thirty-two cases of endometrial cancer who had curettages from one to twenty-three years before frank invasive endometrial carcinoma was diagnosed.

Equally strong arguments can be found that

indicate that endometrial hyperplasia, though an extremely common disease, is unrelated to the subsequent development of endometrial carcinoma.

Fahlund and Broders¹³ doubt any such association of cancer with hyperplasia and suggest that endometrial carcinoma is more likely to occur in cases in which an atrophic endometrium is found.

Taylor¹⁴ feels that the relative frequency of hyperplasia undoubtedly indicates that the individual patient with the disease is relatively safe.

Schröder⁵ definitely concluded that hyperplasia is not a precancerous lesion on the basis of observing the development of only ten cases of cancer of the endometrium among 3,295 definite cases of hyperplasia studied over a forty-year period. This is an incidence of 0.31 per cent and is less than might be expected if the association occurred by simple unrelated chance.

An effort to check on our cases of endometrial hyperplasia treated at the University of Minnesota Hospitals between 1939 and 1949 was made by sending questionnaires to the patients. A period of seven to seventeen years had elapsed since the patients' initial therapy.

Information was secured on 139 of the 162 cases for a follow-up of 85.8 per cent.

Seven of the patients had died since leaving the hospital. One had cancer of the breast, and one a coronary thrombosis. Two had cerebral vascular accidents. One died of uremia and two from unknown causes. None had died of or with known pelvic carcinoma.

Seventeen of the patients subsequently had hysterectomies elsewhere and pathologic reports on the surgical specimens failed to produce a single cancer.

The remaining 115 patients who replied to our questionnaires were well and free of known cancer of the endometrium.

This study, of course, is inconclusive. The number of cases is small. Some may consider seven to seventeen years too short a period for the patients to develop their cancers. Of course, one might conclude that all of our endometrial cancers are in the twenty-three (14.2 per cent) cases on whom follow-up was impossible. There is no evidence to support this, but the search for

(Continued on Page 193)

Tumors of the Gall Bladder

I. Cholesterol Pseudo-Polyps

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IN A PERIOD of seven years, thirty patients with an x-ray diagnosis of papilloma of the gall bladder by cholecystogram have been accumulated. Seven of the patients have been operated upon and one patient autopsied. In these eight, a pseudo-polyp has been found and not a neoplasm as the x-ray term suggested.

The cholecystographic diagnosis was made on finding a filling defect attached to the wall of the gall bladder which did not change position on the patient's assuming an upright position. A minimum of two separate x-ray studies of the gall bladder were made to be certain of a lesion.

In all instances, anatomic verification of the filling defect in the gall bladder x-ray was found. In all eight of the patients, a true neoplasm or a papilloma or adenoma was not found. The findings in seven patients were described by the pathologist as cholesterosis, or actually single or multiple cholesterol polyps. One of these seven had associated small gallstones. One was simply a large gallstone apparently floating, without any other lesions. This gall stone had increased in size over a two-year period of observation, and it seemed very obvious to all concerned that it was a gall-bladder tumor which had grown. The gall stone was asymptomatic. Of the seven with the cholesterosis, two had symptoms strongly suggestive of gall-bladder disease, two had symptoms compatible with gall-bladder disease and three had no symptoms suggestive of gall-bladder abnormality.

Grossly, the cholesterol polyp is a large localized collection of lipid material in a villus of the gall bladder resulting in a papillomatous growth. They are generally multiple and one to five millimeters in diameter. They are easily detached as they are often connected to the wall of the gall bladder by a very fine pedicle, and one can easily

visualize their breaking off to becoming the nidus for gallstones.

Microscopically, one finds in the submucosa a localized collection of foam-like cells which are macrophages with ingested fatty material. This, if the lesions are small enough and diffuse enough, makes a "strawberry" gall bladder. If one of the strawberry lesions becomes large enough, a cholesterol polyp results.

This lesion has been popularly and inaccurately called a papilloma by x-ray description. This term suggests a true neoplasm or epithelial growth which, of course, it is not. Kirklin¹ found an 8.5 per cent incidence of papilloma of the gall bladder in 17,000 surgically removed gall bladders. Gross or histologic pathology was not described in his multiple publications on the subject but, judging from the photographs, he apparently was using the term papilloma for a localized polypoid collection of lipid material, or a cholesterol pseudo-polyp. It is from this report that a papilloma of the gall bladder has received the popular supposition of being fairly common, and is the basis for confusion in the literature. Modern-day pathologists are unable to include a cholesterol polyp as a true neoplasm; therefore, we now find that a papilloma or true polyp of the gall bladder is a rare lesion. In fact, in 1936 Kerr and Lendrum² accepted only seven cases of true papilloma of the gall bladder by rigid criteria. Kane³ found an incidence of 0.4 per cent in 2,000 surgical specimens.

Only a few authors have found evidence supporting a possible relationship between adenomas of the gall bladder and carcinoma, and that evidence is not at all convincing. Phillips⁴ reported an adenocarcinoma of the gall bladder in which there was a papilloma in another area of the organ. Lauritzen⁵ reported a case in which a gall bladder containing a papilloma was removed, and a year later the patient had a carcinoma of the common bile duct. Shepard et al⁶ found a case

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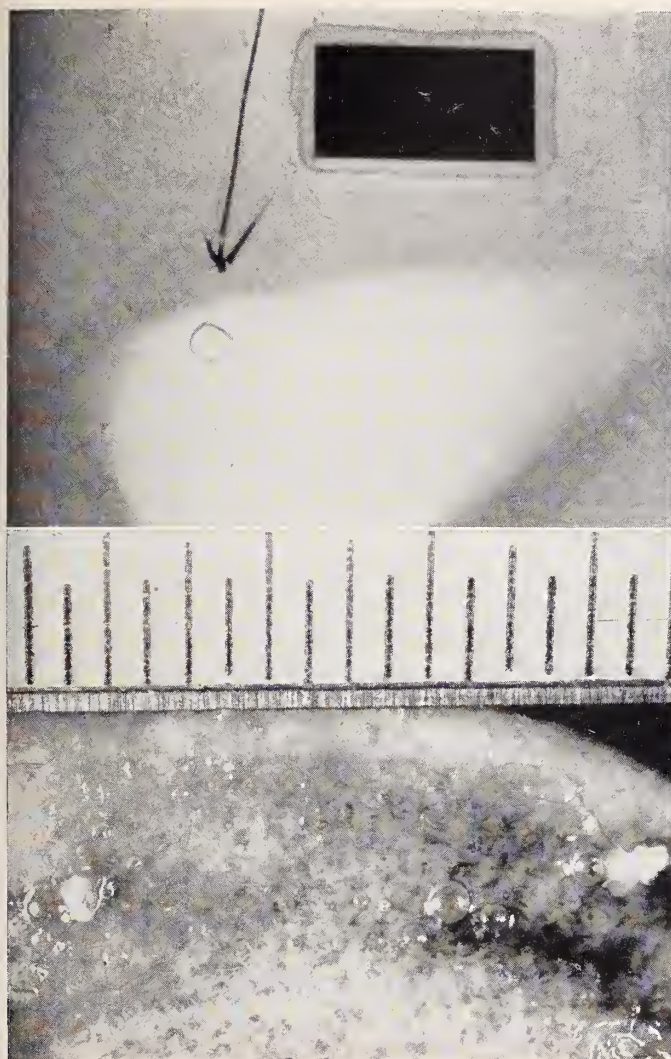


Fig. 1. (*above*) Cholecystogram showing filling defect near the fundus, diagnosed and diagnosed as a papilloma and found in surgical specimen (*below*) to be two cholesterol pseudo-polyps.

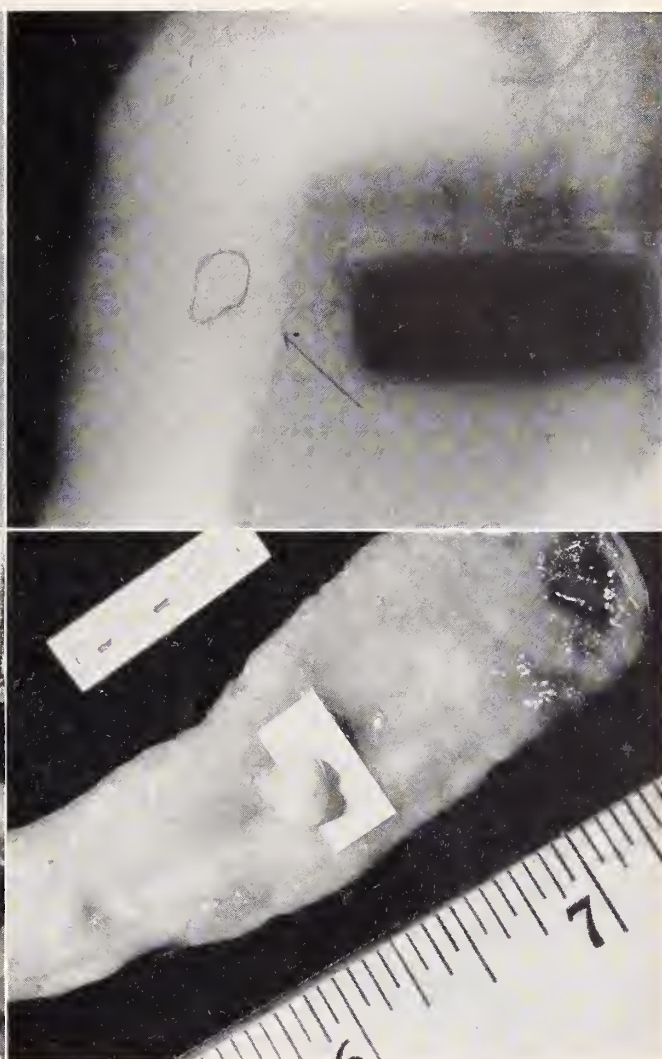


Fig. 2. Cholecystogram (*above*) showing filling defect in the body of the gall bladder, diagnosed as papilloma, and surgical gross specimen (*below*), showing one large and one small cholesterol pseudo-polyp.

of adenocarcinoma (Brody grade one) in a polyp of the gall bladder. Kerr and Lendrum² report three cases of carcinoma in which there was an associated papilloma formation. Tabah and McNeer⁷ present the best evidence in reporting four cases of true papilloma of the gall bladder in three of which there was carcinoma *in situ*.

Bockus⁸ considers cholesterosis as giving symptoms. It seems likely that the cholesterosis leads to small biliary calculi and eventually the clinical picture of cholelithiasis, choledocholithiasis and cholecystitis.

A diagnosis of cholelithiasis having been made, it is felt that the patient should, everything else being equal, have the gall bladder removed before complications occur. Approximately one-third of pa-

tients with cholesterol pseudo-polyps have an associated cholelithiasis.⁹ It should be remembered in considering this, that two-thirds or more of the cases of carcinoma of the gall bladder have an associated cholelithiasis. It seems impossible to tell whether or not the mucosal lesion is a cholesterol polyp or a true papilloma or adenoma. By the same token, it would seem impossible to know whether or not the lesion is an early cancer of the gall bladder, and it is only with such a lesion that carcinoma of the gall bladder seems curable.

From the surgical viewpoint, when there is a filling defect of the gall bladder, cholecystectomy should be strongly considered. A cholesterol pseudo-polyp could be the correct diagnosis or there could be, and frequently is, associated cholelithia-



Fig. 3. Cholecystogram (*above*) showing lesion diagnosed as a papilloma, but in a surgical specimen (*below*) a cholesterol pseudo-polyp was found instead of a neoplasm.

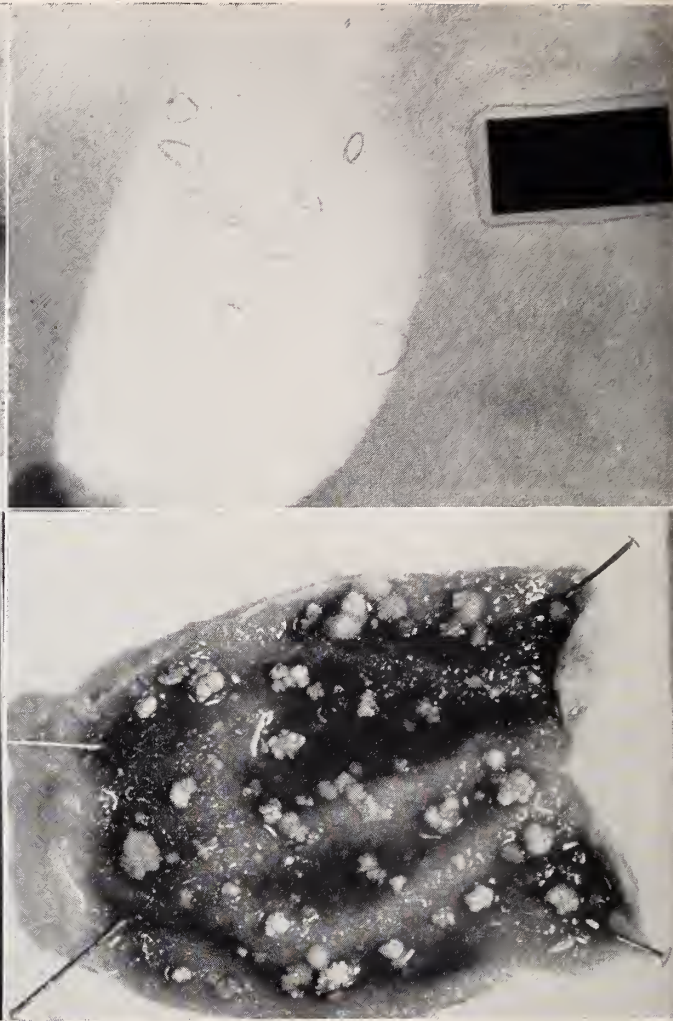


Fig. 4. Gall-bladder x-ray (*above*) showing multiple filling defects diagnosed as multiple papilloma or polyposis, but surgical specimen (*below*) shows multiple cholesterol pseudo-polyps.

sis. There might be a true mucosal lesion and, though not proven, possible malignant degeneration, or the patient might have an early curable carcinoma of the gall bladder. Cholesterosis, or the isolated lesion called a papilloma, is frequently symptomatic.

Surely, no such conclusion can be drawn from these data, and insufficient knowledge exists in the literature to permit a definite conclusion. It might well be that more conservatism is indicated. Prescribing the usual gall-bladder diet, perhaps with bile salts, and following these lesions by repeated x-ray examination, might be profitable, and does not seem unreasonable. The effect of a very low fat diet would be most interesting to note.

Summary

Eight patients with a cholecystographic diagnosis of papilloma of the gall bladder were operated

upon or autopsied. A morphologic lesion was confirmed at surgery, but the anticipated epithelial papilloma or true adenoma was not found as anticipated. Instead, a cholesterol or pseudo-polyp was found in seven patients and a common gallstone in one patient. One must remember that the x-ray diagnosis of papilloma is purely a morphologic, not a histologic, diagnosis, and hence does not mean a neoplasm. In fact, the x-ray diagnosis of papilloma appears to be quite accurate in revealing a cholesterol pseudo-polyp. A filling defect suggestive of a papilloma or adenoma in a cholecystographic study, as interpreted by the surgeon, should be removed. Cholesterosis is frequently symptomatic and associated with cholelithiasis, and this would lend support to the decision to remove the gall bladder. However, the chance that a true papilloma is present is apparently very slim, and malignant degeneration seems even remote.

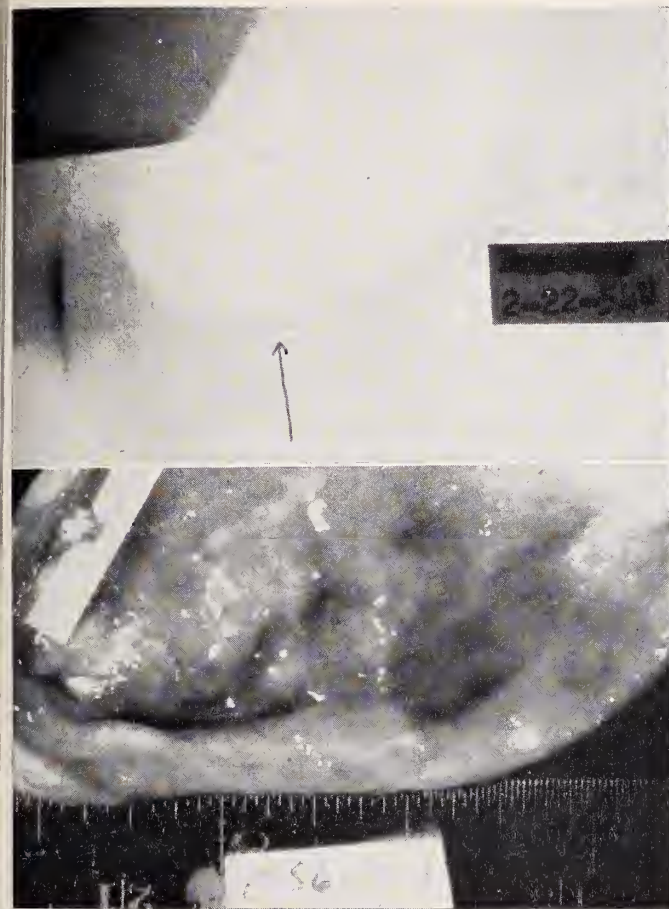


Fig. 5. Single papilloma diagnosed by cholecystogram (above) which, on surgical specimen (below) was a polypoid collection of macrophages containing a lipoid material or a cholesterol pseudo-polyp.

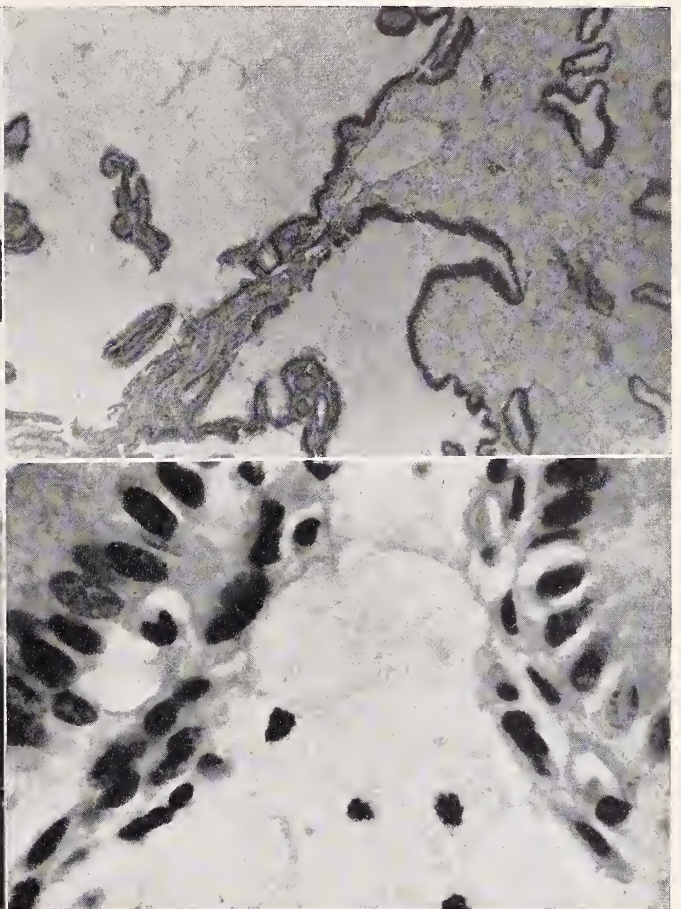


Fig. 6. (above) Typical histologic section of a cholesterol pseudo-polyp showing the characteristic thin pedicle and the large macrophages with ingested lipoid material or foam cells on the right.

Fig. 7. (below) High power magnification of a cholesterol pseudo-polyp. Note the normal gall-bladder mucosa on both sides, and in the center the macrophages with typical foamy or fatty cytoplasm.

The chance of finding an early operable carcinoma of the gall bladder seems exceedingly remote. The diagnostic term papilloma should not be used in describing a roentgenographic lesion.

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MONEY IS ELUSIVE

Money is such an elusive thing—not only to get and keep, but even to keep track of. New reports say that Americans owe more than ever before, some 700 billion dollars in public and private debt—up a whopping 294 billion since World War II ended. But along with this, the reports say also that Americans are richer than ever before—they own, in public and private wealth,

some 1½ trillion dollars' worth of property, and this year their income will be 340 billion dollars. But still another report says that all this doesn't mean what it seems to mean; that rising taxes and inflation since 1939 have made \$6,122 now equal actually to only \$3,000 then. However you slice it, money, it seems, is still purely relative.—*B. C. Enquirer*, October 24, 1956.

Case Presentation

Obstetrical Hemorrhage Into the Broad Ligament

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POST-PARTUM hemorrhage is usually obvious. However, it may be concealed and present a greater diagnostic and therapeutic problem. Post-partum hemorrhage may also present itself as a combination of external and concealed bleeding as the case to be presented shows.

Case Report

Mrs. L. B., a thirty-nine-year-old multipara, was at term and a frank breech was presenting.

Past History:—Her first baby was born February 11, 1947, when she was aged twenty-nine. During this pregnancy the blood pressure ranged from 130/88 to 160/86. All urinalyses were normal. Her second delivery was January 27, 1948. This was a 7 pound 4½ ounce footling breech extraction with a moderately severe postpartum hemorrhage. Blood pressure range during this pregnancy was from 134/66 to 142/74. An appendectomy was done on January 6, 1949. Exploration then showed a congenital absence of the right tube and ovary, and a severely ptosed right kidney. Her third delivery on August 9, 1951, was a footling breech with a 5 pound 14½ ounce baby. During this pregnancy all urinalyses were normal. The blood pressure varied between 128/66 and 170/84. On October 5, 1951 a dilatation and curettage was done for abnormal bleeding due to subinvolution of the uterus. At the same time an abscess of the left breast was incised and drained. On July 10, 1953 a dilatation and curettage was done for a missed abortion. Following this she had amenorrhea for eight months and then resumed regular periods.

Present Pregnancy:—Her last menses was on December 16, 1954. On March 8, 1955 her blood pressure was 120/64. The urine had a foul odor, albumin was 3+, and the sediment showed mixed bacteria 4+. On March 29 the blood pressure was 136/70. The urine albumin was 4+, and the sediment showed a marked pyuria and a large number of mixed bacteria. She had marked varicose veins of the left leg with two sites of superficial thrombosis in the left thigh. On April 7 the urine was negative except for an occasional finely granular cast. The pyuria had cleared under Gantrisin®. Blood pressure and urinalyses remained normal

through May, June, and July. She was next seen on August 1 with leg edema of two weeks' duration. Her weight was 142 pounds, a gain of twenty-eight pounds in six months. The heart was normal, and the blood pressure was 122/56. The urine showed 2+ albumin and a large number of coarse granular casts. She was placed on a low sodium diet, was given 1 cc Salyrgan Theophylline intravenously, and one tablet of Neohydrin daily was prescribed. On August 9 the edema was less, and the weight was 139 pounds. Urinalysis showed albumin 1+ and ten to twelve fine and coarse granular casts per low power field. The above treatment was continued. On August 16 the weight was 136¾ pounds, blood pressure was 124/70, and the urine sediment still showed numerous coarse granular casts. On August 24 her weight was 134½ pounds and urinalysis was normal. There had been no leg edema for several days. A diagnosis of breech presentation was made. On August 30 there was no edema, the weight was 134 pounds, and the blood pressure and urinalysis were normal. On September 13 the weight was 133 pounds, the blood pressure was 144/76, and the urinalysis was normal. The cervix was ripe, and a frank breech presented. Pelvic measurements were normal. The patient was blood Group A, Rh positive.

Her membranes ruptured at home at 10:45 a.m. on Sept. 14, 1955. There were no contractions present. She entered Loretto Hospital at 11:05 a.m. Her previous labors had all been very rapid. A sterile pelvic examination at 12:30 p.m. substantiated the diagnosis of a frank breech presentation. At 1:30 p.m. with the contractions still very irregular and feeble, she was given a single dose of Pitocin, minims 2, and shortly went into active labor. At 2 p.m. the cervix was 4-fingers dilated, and the frank breech was stationed at the spines. She was catheterized, and a pudendal block of Novocaine with Wydase was done. The breech was allowed to descend to the vulva spontaneously. When there was definite bulging, a wide left lateral episiotomy was done. A hooked finger was put into the baby's groin for traction. Supplementary Trilene anesthesia was given. The impacted breech was easily broken up, and both feet and legs delivered. A routine breech extraction was done with minimal difficulty and without undue haste, aided by previous relaxation and the wide episiotomy. The head was easily delivered by a Mauriceau maneuver. A male baby was born at 2:15 p.m., weighed 8 pounds, 10 ounces, and breathed spontaneously. At 2:40 p.m. the placenta still had not separated and resisted efforts at expression. After changing to

Presented at the annual meeting of the Southern Minnesota Medical Association, New Ulm, Minnesota, September 10, 1956.

sterile gloves the uterine cavity was explored. The placenta was firmly adherent to the uterine wall. Manual removal of the placenta was done using the sides of the fingers to develop a cleavage plane. Examination of the placenta showed it to be apparently intact. The episiotomy was repaired. At this time the general condition of the patient was poor. She was retching and appeared to be in impending shock. The blood pressure was 84/64. Pitocin 1 cc had been given immediately after the birth of the baby. Ergotrate 1 cc intravenously had been given immediately after the manual removal of the placenta had been completed. The blood loss was estimated at 300 cc. The uterus was firmly contracted. The patient was returned to her room at 3 p.m., still nauseated.

At 3:30 p.m. the blood pressure was 84/64, and the pulse rate was 126. The skin was cold and slightly clammy. An intravenous infusion of 5 per cent glucose in saline was started at this time, and was replaced with 1 pint of compatible Group A, Rh positive blood at 4:10 p.m. At 5:15 p.m. the blood pressure was 98/80. At 6:00 p.m. she was no longer nauseated and her skin was warm. She had saturated 3 pads. Another 500 cc of bank blood was given. At 6:40 p.m. her blood pressure was 120/80, her pulse was 104 and the uterus firm. The transfusions were completed at 7:00 p.m. At 7:10 p.m. the patient had a frank uterine hemorrhage, and the blood pressure dropped to 82/70. The patient was again in shock but conscious and rational throughout this time. 250 cc of Gentran was given intravenously, and 500 cc of saline with 1 cc of Pitocin added was started in another vein. Dr. P. J. Kitzberger was called as consultant. One ampoule of Wyamine was given. The third pint of blood was started as soon as it was available at 8:00 p.m. The uterus was 2 fingers above the umbilicus and was relaxed, but contracted with massage and Pitocin, only to relax again. An interesting observation was that shock deepened after each attempt at massage of the uterus. The patient continued to bleed *per vaginam*. At 8:45 p.m. the blood pressure was 50/20 and the pulse rate 120. A soft doughy mass was starting to form in the left lower quadrant. The bladder was catheterized, and the urine was normal, thus ruling out bladder injury. 600 cc of compatible fresh blood was taken from the husband, and transfused into the patient. At 9:30 p.m. the mass in the left lower quadrant was definitely growing, and the blood pressure was still 50/20. We felt that there was continuing bleeding into the left broad ligament and that emergency surgery was indicated despite the continuing shock. A local surgeon was called into consultation, and all agreed on emergency surgery despite the desperate condition of the patient.

Surgery was started under local anesthesia at 10:45 p.m. with the blood pressure at 46/0. An additional 1,000 cc of bank blood was given during surgery with forced pumping. The abdomen was opened. There was no free blood in the abdominal cavity. There was a large hematoma in the left broad ligament which dissected upward retroperitoneally. The previously known congenital absence of the right tube and ovary

was again noted. There was no free perforation of the uterus into the abdominal cavity. An emergency subtotal hysterectomy was done starting on the left side. As soon as the source of bleeding into the left broad ligament was clamped there was a noticeable improvement in the general condition of the patient, similar to that seen in surgery for ruptured ectopic pregnancy. Sodium pentothal was started as supplemental anesthesia. The hematoma of the left broad ligament and retroperitoneal area was evacuated. Careful attention had been paid to avoid injury to the ureters. After being sure that hemostasis was complete, the abdomen was closed in layers. The immediate postoperative condition of the patient was noticeably better than her preoperative condition. The transfusions were completed before she was returned to her room. By 1:30 a.m. her pulse was 96 and blood pressure was stable at 122/80.

The pathologic report received from Robert Hebbel, M.D., of the University of Minnesota Department of Pathology is as follows: "The uterus is about 15x15x10 cm. over-all. The walls are greatly thickened and the lining is roughened and hemorrhagic through most of the cavity. The attached left tube is 5 cm. long, and the ovary is 3x3x1 cm. Multiple gross sections of the uterine wall show no abnormality of the muscle. Microscopic sections show placental tissue intimately involving the muscular wall." These findings are in keeping with a diagnosis of placenta accreta.

The patient made a relatively smooth postoperative recovery. On several occasions, always at night, she had attacks of left lumbar pain lasting up to two and one-half hours. The last attack was two days before discharge from the hospital on September 23, 1955. After leaving the hospital she developed a left uretero-cervical fistula due to injury to the left ureter at the time of the emergency hysterectomy. She was referred to Mayo Clinic for treatment of this condition. Treatment there was complicated by the fact that the severely ptosed right kidney contained a large calculus, making reconstructive surgery on the left ureter mandatory in an attempt to save her better kidney. She is still under observation at the Mayo Clinic at this time.

Comment

Quoting and taking excerpts from "Obstetric Practise" by Speert and Guttmacher we find the following: (McGraw-Hill Co., New York, 1956) "In rare cases placental separation fails to occur because of a deficiency or absence of the maternal decidua at the placental site, with the resultant invasion of the myometrium by the chorionic villi. This condition is known as placenta accreta. Not only does it prevent spontaneous separation of the placenta, but it resists attempts at manual removal as well, because a cleavage plane between the placenta and uterus can not be established. Placenta

accreta should be suspected in cases of retained placenta if careful attempts at manual removal prove unsuccessful because of the operator's inability to peel the placenta from the uterine wall. The diagnosis can only be proved on microscopic examination of the excised uterus, which reveals an absence of decidua vera, the chorionic villi lying in direct contact with the myometrium. Placenta accreta is best treated by immediate hysterectomy."

"In contrast to the external bleeding that occurs from lacerations of the cervix, the major hemorrhage from tears of the corpus is usually concealed, either in the peritoneal cavity, in the broad ligaments, or under the bladder peritoneum. Traumatic rupture of the uterus may be caused inadvertently by internal podalic version, the obstetric forceps, excessive force applied to the abdomen during the second stage, or manual removal of the placenta. The tear, usually occurring in the lateral walls of the lower segment, often extends into the uterine vessels. Both vaginal and intra-abdominal hemorrhage are common; the latter may be free into the peritoneal cavity or between the leaves of the broad ligament, where it creates a hematoma. Severe pain and tenderness in one of the lower quadrants of the abdomen is usual, although it was not present in the case reported. Shock appears quickly and deepens rapidly. Most ruptures of the intact uterus occur during delivery. The most significant sign is the

continuation of brisk hemorrhage from a well contracted uterus after the placenta has been delivered. The treatment of uterine rupture is immediate laparotomy. Transfusions should be started while preparations are being made for operation, even in the absence of shock. In most instances a subtotal hysterectomy is performed, but if the rupture extends upward from a cervical laceration total hysterectomy may be necessary to control bleeding. The proximity of the ureter should be kept in mind and its ligation carefully avoided in cases of hematoma of the broad ligament."

Summary

The case reported is that of a patient who had a bad obstetrical past history. During the present pregnancy she had pre-eclampsia. She had a frank breech delivery complicated by manual removal of a retained placenta accreta. This resulted in perforation of the left lower uterine segment with dissecting hemorrhage into the left broad ligament, and delayed external postpartum hemorrhage, causing exsanguination and prolonged shock. A growing mass developed in the left lower quadrant. An interesting observation was a temporary deepening of the shock following each palpation or attempted massage of the uterus. Emergency hysterectomy was done with injury to the left ureter.

STEM PESSARIES RULED DANGEROUS

The Food and Drug Administration said today that stem pessaries are dangerous and should be removed from the market at once. In a formal policy statement published in the Federal Register, FDA concluded that "stem-type and wing-type intracervical and intrauterine pessaries are dangerous to health, and regardless of their labeling, may be shown to be misbranded." Distributors were advised by FDA to remove such articles from the interstate market at once, with a strong hint that otherwise court proceedings would be instituted.

FDA emphasized, however, that its action does not apply to other types of pessaries which are safely used following surgery and for supportive purposes.

The policy statement declares that it is now the consensus of medical opinion among experts qualified by scientific training and experience to evaluate the safety

of such devices that stem-type and wing-type intracervical and intrauterine pessaries are dangerous for use under any form of labeling and serve no useful purpose.

Dr. Albert H. Holland, Jr., Medical Director of the Food and Drug Administration, said that such devices have been used as contraceptives for many years but are not reliable for preventing pregnancy. He said the pessaries have been labeled for use only under medical supervision since 1941 and that the decision to institute legal action against them was reached as a result of a recent medical survey in which 92 per cent of the experts consulted regarded these devices as dangerous for use under any conditions. These opinions were supported by many known cases of injuries, infections, cancer, and pregnancy associated with the use of such pessaries.

Current Concepts of Osteoporosis

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OSTEOPOROSIS, the commonest systemic disease of the skeleton,^{8,100} has generally been defined as a decrease in bony tissue in which the primary disturbance is lack of bone matrix formation.^{3,85}

This paper will consider etiology, diagnosis, and clinical features of osteoporosis largely as background against which therapeutic measures can be discussed. The author believes that therapeutic progress will be based on new knowledge of the biochemistry and physiology of bone. For this reason, recent studies on the composition of bone and the mechanism of calcification will be presented.

Classification

The following table, modified after Albright and Reifenstein,⁸ presents a useful means of classifying osteoporosis. Separation of osteoblastic function from the quality or amount of the matrix is arbitrary.^{37,81} The existence of a "defect unknown" group indicates the need for further study.

I. Defect in Osteoblasts

- A. Loss of stress and strain (e.g. immobilization, poliomyelitis, old age).
- B. Estrogen lack.
 1. Postmenopausal state.
 2. Congenital hypoenestrogenism (e.g. ovarian agenesis, panhypopituitarism, the syndrome of isolated pituitary FSH deficit).
- C. Congenital osteoblastic defect (e.g. osteogenesis imperfecta).

II. Defect in Matrix

- A. Loss of androgen.
 1. Eunuchoidism.
 2. ? Senile osteoporosis.
- B. Loss of protein.
 1. Malnutrition (e.g. hyperthyroidism, poorly-controlled long-standing diabetes mellitus, nephrosis).
 2. Hypovitaminosis C.
 3. Cushing's syndrome.
 4. The "alarm reaction."

III. Defect unknown

- A. Acromegaly.
- B. Idiopathic osteoporosis.

Clinical Aspects of Osteoporosis

Osteoporosis may occur at any age, but reaches a peak incidence between the ages of sixty and sixty-five years.¹² Females are affected four times as frequently as males,^{10,21,26,74} female preponderance being even higher among younger patients.⁹⁹

The commonest symptom of osteoporosis is low back pain. Extensive vertebral collapse may cause a loss of height. With the exception of the spine, osteoporotic bones are neither tender nor painful.¹⁶

Diagnosis is based upon characteristic radiologic findings coupled with normal laboratory values for serum calcium, phosphorus, and alkaline phosphatase.

Bony demineralization is most commonly noted in the spine upon radiologic examination. Compression fractures may be seen; intervertebral discs may balloon into the central portion of the vertebral bodies producing typical "codfish vertebrae." The pelvis and ribs are frequently demineralized. The skull is rarely involved except in far-advanced disease; demineralization here is most characteristically localized to the frontal and parietal bones.⁹⁹ The remainder of the skeleton is less often affected,¹⁰⁰ and the lamina dura are preserved.

Correlation of radiologic findings with the severity of symptoms is exceedingly poor.⁸³ Conversely, while therapy may produce striking symptomatic improvement and appreciable increases in total body calcium, increase in bone density is exceptional.^{35,95} Correlation of x-ray changes with data on calcium balance depends on the distribution of the osteoporotic process. Thus relatively small calcium losses may accompany the evolution of osteoporosis in an extremity in poliomyelitis,¹⁰⁵ whereas up to 60 per cent of the total body calcium may be lost without radiologic evidence of osteoporosis in the spine.²⁷ New objective tech-

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niques for evaluation of bone density⁶⁷ may possibly increase the value of future radiologic studies.

The usually normal laboratory values for serum calcium, phosphorus, and alkaline phosphatase support the interpretation that osteoporosis is a disease of tissue rather than calcium metabolism. However, hypercalcemia may occur during the rapidly progressive phase of osteoporosis, for example during the immobilization of young patients or those with Paget's disease. Whereas most investigators have found serum phosphorus normal,^{12,25} Albright, Reifstein, and Forbes have noted a slight but significant elevation of serum phosphorus, which falls with successful treatment.^{8,9} Borderline elevation of alkaline phosphatase may reflect osteoblastic repair of multiple fractures;⁸¹ greatly elevated alkaline phosphatase levels make uncomplicated osteoporosis unlikely.¹⁰⁶

The normal decrease in urinary phosphorus following intravenous calcium may help distinguish osteoporosis from hyperparathyroidism.⁵⁴ Study of urinary calcium excretion following intravenous calcium gluconate has shown a subnormal calcium retention in patients with osteoporosis.⁹³ Although this test does not distinguish osteoporosis from all other osteolytic lesions, it has provided an objective measurement of improvement during the course of successful therapy.¹⁰² Accumulation of additional data defining the normal range of calcium retention during this procedure may make it possible to suggest the diagnosis of incipient osteoporosis prior to the stage of overt roentgenologic demineralization.

Therapeutic Measures

I. Dietary Management

A. Calcium

1. *Effects.*—Many investigators have demonstrated conversion of negative to positive calcium balance in osteoporosis,^{2,12,17,19,25,81,96,97,98} and in normal persons^{24,69,77} by high calcium intake. Three possible mechanisms have been suggested.⁸ First, an increase in available calcium and phosphorus may stimulate osteoblastic activity. Slight nitrogen retention has been observed during metabolic periods on intravenous calcium administration.¹⁹ However, this observation has been made only on a few subjects; furthermore, the assumption that a positive nitrogen balance indicates formation of bone matrix is questionable. Secondly, osteopathies attributed to lack of cal-

cium and phosphorus may really be due to protein starvation. However, this concept hardly accounts for the observed calcium retention when supplementary calcium is added to a diet of constant protein content. Thirdly, increased availability of calcium and phosphorus may decrease resorption of bone. The prevention of osteitis fibrosa generalisata in hyperparathyroidism by high dietary calcium intake⁸ further suggests that resorption of the bony mineral reservoir may be checked if other sources of calcium are readily available.

2. *Present uncertainties.*—Nevertheless, the precise therapeutic status of calcium supplements remains controversial. It is convenient to digress at this point and consider four factors responsible for current uncertainty. First, on theoretical grounds, osteoporosis is a disorder of tissue metabolism rather than calcium metabolism. The classification presented demonstrates the association of osteoporosis with conditions causing decreased synthesis or increased catabolism of protein, whereas osteomalacia (or rickets) is the usual result of calcium or phosphorus deficiency.

Histologic studies, too, are difficult to harmonize with the beneficial effects of calcium supplements. Osteoporotic bones contain a decreased number of osteoblasts or histochemically abnormal osteoblasts;⁸¹ trabeculae are sparse and thin, but there is no microscopic evidence that osteoclastic activity is abnormally increased.^{14,96} That matrix which is laid down is normally calcified.^{3,81}

While direct evidence that osteoporosis is due to inadequate matrix formation has not been presented,³⁸³ the characteristic histology, laboratory chemical findings, and clinical picture make this hypothesis attractive. Convincing evidence that supplementary dietary calcium either stimulates osteoblastic activity and additional matrix formation or inhibits bone resorption (thereby compensating for decreased bone formation) is lacking. We lack a convenient laboratory index of bone resorption; further studies of the turnover of bone mineral utilizing isotope techniques or strontium may clarify the mechanism involved.

Secondly, low calcium intake has not been linked etiologically to the development of osteoporosis, although Groen⁴² (quoted by Snapper¹⁰⁰) offered the clinical impression that the disorder occurs more frequently among food fadists on low calcium intakes. Unfortunately, retrospective stud-

ies of dietary intake are not obtainable once the diagnosis of osteoporosis has been established and therapy instituted. Nor have controlled studies of the earlier phases of the disorder, before x-ray demineralization is evident, been obtainable.

Poor calcium absorption, in contrast to poor intake, has been implicated in the osteoporosis of childhood nephrosis; here, however, the negative balance for calcium parallels a low serum albumin and negative nitrogen balance.³⁴

Bone radiolucency has been produced in young rats by diets poor in calcium phosphate salts.⁴¹ The use of the term "osteoporosis" rather than "osteomalacia" for the syndrome observed is not adequately justified, however.

A third source of confusion on the use of calcium supplements in osteoporosis is our inadequate knowledge of normal calcium requirements. According to the literature,¹ the normal requirement is approximately 800 mgm. daily. However, adaptation to prolonged low dietary calcium occurs, and intakes of 100 to 200 mgm. are not incompatible with calcium equilibrium and apparent good health.⁴⁹ Considerable individual variability in this capacity to adapt to decreased intakes probably exists.⁷⁷ These considerations indicate the need for caution in extrapolating short-term balance data following changes in calcium intake.

Variability in calcium absorption is another factor to be considered in studies on calcium intake. Some persons absorb large amounts of dietary calcium if such is provided; most persons absorb but little calcium no matter how much is eaten, unless the bones have a need for it.⁵³ Such variations in absorption could account for the variable correlation of urinary calcium excretion with calcium intake.^{52,55,61}

The influence of age on dietary requirements is not clear. Animal experiments^{58,59,71} and clinical studies^{1,87} have suggested an increased calcium requirement in the elderly, but others^{24,61,78} have not confirmed this.

Factors influencing calcium absorption include achlorhydria, protein intake, and other dietary constituents. Meulengracht noted achlorhydria in 42 per cent of his patients with osteoporosis,⁷⁴ but animal studies have demonstrated that alkalization of the gastric juice merely increases fecal calcium at the expense of urinary calcium without altering calcium retention.⁹⁴ Human calcium absorption directly parallels protein intake.^{63,70,82} Dietary vegetable content, ingested acids, keto-

genic diets, and dietary calcium/phosphate ratio may also influence calcium absorption.⁶¹

Fourth, uncertainty over the therapeutic role of calcium supplements arises from the balance studies thus far conducted in osteoporosis. In these studies, diet is generally maintained constant while the additive effects of steroids or other agents is determined. The author has encountered no data analyzing the effect of calcium supplements given after a base-line period of optimal hormonal therapy.

3. *Recommended Regimen.* — Albright and Reifenstein assert that "since osteoporosis is not a disease of calcium and phosphorus metabolism, excessively high intakes of these minerals and vitamin D are probably not indicated."^{8,85} Others,^{81,98} citing the positive calcium balance produced by dietary measures alone, recommend 1.5 to 2.0 grams daily. At about this level a ceiling is reached,⁹⁸ above which additional calcium intake is quantitatively excreted.

B. Phosphorus

Uncertainty over optimal dietary phosphorus in osteoporosis parallels our confusion over calcium in therapy. Phosphorus equilibrium is attained on intakes of 1000 to 2000 mgm. daily according to the literature.¹ Whether advanced age increases^{1,87} or decreases⁷⁸ requirements is uncertain. The effect of added phosphate on calcium absorption in normal persons is also uncertain.^{66,68} In osteoporosis, a decrease in phosphorus intake causes a decrease in estrogen-induced positive calcium balance,¹² and large doses of NaH_2PO_4 increase the retention of intravenous calcium.¹⁹

In practice, most clinicians feel that diets adequate in protein^{81,85} and calcium^{81,98} provide sufficient phosphorus.

C. Vitamin D

Since 10,000 to 50,000 units of vitamin D daily may increase mineral retention in patients without overt hypovitaminosis on optimal diets,⁹⁶ some clinicians^{13,81,96} recommend this measure routinely, particularly for patients confined indoors.

II. Other Minerals

A. Strontium

Because strontium resembles calcium in its physical and chemical properties, Shorr and Carter have investigated its effect in osteoporosis.^{27,96,97,98}

After maximal calcium retention has been achieved through the use of high calcium intake, addition of 1.7 grams of strontium daily approximately doubled the total calcium plus strontium retention.⁹⁶ Additional tristrontium phosphate is retained without decreasing calcium salt retention. The additive effect of strontium in augmenting "lime salt" retention is further increased by vitamin D, estrogen, and/or androgen therapy.

Clinically, subjective improvement corresponded better with the combined strontium and calcium retention than with the calcium retention alone, according to Shorr and Carter.⁹⁸ Although strontium is not a normal dietary constituent, it is apparently nontoxic for long periods in the dosage indicated.^{28,98}

These studies, like those on calcium supplements, apparently indicate that mineral retention can occur in osteoporosis without significant nitrogen retention.⁹⁷ Further study on the clinical use of strontium is indicated; in particular, its effect when added to a base line optimal hormonal regimen is unknown.

B. Copper

Copper deficiency can produce osteoporosis in dogs.¹⁸ To date, this finding has not been related to human osteoporosis. Further studies on the relation of copper to ascorbic acid metabolism are needed.

III. Endocrine Therapy

The association of osteoporosis with gonadal insufficiency provided the initial rationale for the therapeutic trial of estrogens and androgens. The clinical observation of female preponderance in osteoporosis supports this hypothesis; the menopause occurs earlier in life than the cessation of Leydig cell activity, and thus gonadal deficits may occur earlier and more frequently in the female.⁴ Finally, one would expect hormonal therapy to be most successful when an actual deficiency exists; indeed those "idiopathic" cases of osteoporosis unbenefited by gonadal steroids^{8,13} are characteristically normal endocrinologically.

A. Estrogen

The effect of estrogen on the skeleton has been investigated in osteoporosis, in normal humans, and in experimental animals.

1. *Effects in osteoporosis.*—In postmenopausal and in senile osteoporosis, estrogen administration

causes a decrease in both fecal and urinary excretion of calcium and phosphorus, occurring in about six days, reaching a maximum after one month, and persisting more than a month following hormone withdrawal.^{8,12} Urinary nitrogen excretion is but transiently decreased. An additive effect on calcium retention is demonstrable in androgen-treated patients. Qualitatively similar estrogen effects are noted on calcium intakes ranging from 200 mgm.⁸ to 2000 mgm.⁹⁶ daily; further quantitative studies are needed. Symptomatic improvement generally parallels calcium retention.^{8,81,98}

2. *Effects in normal persons.*—To what extent the effects of estrogen in osteoporosis depend on the existence of gonadal insufficiency is not clear. Retention of calcium,¹⁹ phosphorus,^{19,62} and nitrogen⁶² has been noted in normal females given estrogen. The effects of estrogen in elderly males without osteoporosis were qualitatively similar but of lesser magnitude than in patients with senile osteoporosis.²⁵ On the other hand, the normal positive calcium balance in adolescent girls was decreased by estrogen administration.⁵⁷

3. *Effects in animals.*—The results of estrogen administration to experimental animals shed little light on the mechanism of estrogen action in human osteoporosis. This is largely because effects vary according to the species and dosage employed as well as the age and endocrinologic status of the animal. Birds^{22,64,65,79,80} respond with marked endosteal bone proliferation, eventually obliterating the marrow spaces, correlated with a rise in nondiffusible serum calcium levels. Similar changes occur in untreated female pigeons during the egg-laying cycle; endosteal bone apparently serves as a reservoir of readily available calcium for egg shell formation. In mice, increased endosteal bone formation and decreased bone resorption were noted;^{8,103} however, when estrogen was begun in older mice, the resorptive process was accentuated rather than inhibited.⁴⁰ Interestingly, the mouse skeleton is not a homogeneous target organ; estrogen produced bony proliferation of the femur with concomitant dissolution of pelvic bones.³⁹ In young rats estrogen interferes with endochondral ossification by inhibiting resorption of cartilage matrix and new bone.¹⁰³ Estrogen-treated castrates show increased endosteal osteoid production in response to experimental fractures,⁸⁴

and serum calcium elevations have been noted.⁸⁷ In hamsters, guinea pigs, rabbits, dogs, and cats there is apparently no specific estrogen effect upon bone production.¹⁰³

4. *Therapeutic regimen.*—Natural or synthetic estrogens are equally effective in the treatment of osteoporosis. Any of the following preparations give equivalent results:⁸

(a) Diethylstilbestrol, 0.5 to 1.0 mg., daily, by mouth.

(b) Estrone sulfate, 2.5 to 3.75 mg., daily, by mouth.

(c) Estradiol benzoate, 1.66 to 3.32 mg., three times weekly, intramuscularly.

(d) Estradiol dipropionate, 5 mg., once weekly, intramuscularly.

Higher doses apparently confer no added benefit.^{8,12,48}

To avoid excessive uterine bleeding and possible carcinogenic effects, estrogen should be withdrawn in females at intervals of four to six weeks for a period of seven to ten days.⁸ Alternatively, progesterone may be administered for five days in daily intramuscular doses of 5 mg., or in the form of anhydrohydroxy progesterone, 40 to 60 mgm. daily by mouth.⁸ Examination of the vaginal smear twice yearly³⁸ and periodic pelvic examinations are additional safeguards. Salt restriction may be necessary to prevent edema.

B. Progesterone

Progesterone is used in osteoporosis only as a means of preventing endometrial hyperplasia. Combined with estrogen or given alone in amounts up to 100 mg., it is without effect on metabolic balances.⁸

C. Androgen

1. *Metabolic effects.*—Administration of androgen to patients with osteoporosis causes a decrease in both fecal and urinary loss of calcium and phosphorus. The effect occurs slowly and persists long. In contrast to estrogen, androgen administration causes a prolonged decrease in urinary nitrogen, and a positive nitrogen balance is attained. Following hormone withdrawal, calcium retention persists longer than phosphorus or nitrogen retention.⁸

2. *Mechanism of action.*—While the mode of action of androgen at the cellular level is not known, the benefit conferred on osteoporotic patients seems to reflect a general anabolic effect. Perhaps for this reason, androgen therapy has seemed more effective than estrogen in osteoporosis associated with excessive protein breakdown, i.e., Cushing's syndrome⁷ or thyrotoxicosis.⁶⁰ Adrenal biopsies of a patient with Cushing's disease revealed striking changes in the histochemical staining properties of the zona fasciculata, correlated with testosterone therapy.⁴ The suggestion that the action of androgen involves inhibition of production of anti-anabolic adrenal steroids awaits confirmation by more precise analyses of adrenal corticoids. An additional mechanism of action must also be present to account for the nitrogen and phosphorus retention in patients with Addison's disease on androgen therapy.⁴

3. *Effects on osteogenesis.*—Whereas androgen prevents excessive osseous growth when administered to certain mammals receiving estrogen,⁴⁰ this effect is apparently species specific. A synergistic rather than antagonistic action with estrogen occurs in the pigeon,^{3,79} and "man apparently resemble the pigeon rather than the mouse in this regard."⁸

Although evidence from animal studies is difficult to apply and the direct evidence is insufficient, it seems probable that testosterone stimulates both endochondral and endosteal bone formation in man.³

4. *Therapeutic regimen.*—The following regimens have been recommended for androgen therapy of osteoporosis:⁸

a. Methyltestosterone, 10 to 20 mg., daily, by mouth.

b. Testosterone propionate, 10 to 25 mg., once weekly, intramuscularly.

c. Testosterone, 2-75 mg. pellets implanted subcutaneously every three or four months.

Doses exceeding 300 mg. of androgen monthly risk virilization of female patients⁸⁵ and increase the problem of salt retention and edema formation. Estrogen should be administered concurrently in males, for its synergistic effect on calcium retention, and to neutralize androgenic stimulation of the prostate.⁵⁶

D. ACTH and Adrenal Cortical Hormones

The osteoporosis and pathologic fractures of naturally occurring^{32,101} or iatrogenic^{31,37} Cushing's syndrome, and experimental data showing the deleterious effect of cortisone on mucopolysaccharide formation and on bone healing,²³ indicate the hazard involved when these agents are used in patients with osteoporosis. However, the usual rise in urinary calcium excretion produced by ACTH or cortisone³³ was not consistently duplicated by Hjorth and Dragsted.⁵⁰ These investigators concluded that short-term adrenal cortical hormone therapy was not absolutely contraindicated by the presence of osteoporosis if indicated for an acute concomitant disease process.

IV. Intravenous Albumin Therapy

The malnutrition often associated with osteoporosis, and the improved calcium absorption on high protein diets^{63,70,82} are adequate grounds for administration of liberal quantities of protein in osteoporosis.^{81,85} Nonetheless, oral albumin⁵ and casein hydrolysate⁸ have been without effect on the calcium balance of refractory patients.

The parallel fluctuations of calcium balance, serum albumin levels, and nitrogen absorption in childhood nephrosis³⁴ have suggested investigation of the therapeutic value of plasma transfusions and intravenous albumin in osteoporosis. Thus far these effects have been explored in isolated cases of idiopathic osteoporosis refractory to hormonal therapy,^{4,5,8,13} osteogenesis imperfecta,⁵ and postmenopausal osteoporosis.⁵ With elevation of serum albumin levels both diffusible and nondiffusible serum calcium rise, and urinary calcium excretion decreases.

The consistency of this relationship, the correlation of subjective improvement with measured calcium retention, and the paradoxical fall of urinary calcium despite elevation of serum diffusible calcium have suggested that intravenous albumin stimulates bone formation. The possibility has indeed been raised that serum albumin may be a transport form of bone matrix precursor;⁵ since similar effects follow intravenous globin administration,⁵ however, the specificity of this albumin effect is dubious. Paradoxically, alkaline phosphatase levels fall with albumin therapy; this may be a dilution phenomenon or related to the finding that albumin inhibits phosphatase activity *in vitro*.⁵

Since albumin administration promotes urinary

but not fecal conservation of calcium,⁵ its quantitative effect is probably smaller than that of the gonadal steroids. For this reason, and because of the expense and inconvenience of this mode of therapy, it deserves clinical consideration only when more conventional measures fail.

V. Orthopedic Measures

Immobilization relieves pain and, if the latter is severe, the physician may consider the use of corsets, braces, or even spinal fusion.⁴⁸ On the other hand, the removal of stress and strain withdraws an essential stimulus to osteoblastic activity.⁶ This relationship has been documented clinically in studies on osteoporosis in poliomyelitis.¹⁰⁵ During experimental immobilization, the consistent rise in serum calcium levels was prevented and calcium and nitrogen losses were halved by the use of oscillating rather than fixed beds.¹⁰⁴ Thus comparatively minor stresses and strains may inhibit skeletal dissolution.

VI. Therapy of Osteoporosis Summarized

When possible, the treatment of osteoporosis should be directed toward its cause.^{*} Thus, treatment of the underlying disorder will cause improvement of the osteoporosis of immobilization, Cushing's syndrome, hyperthyroidism, acromegaly, hypovitaminosis C, and malnutrition.

A balanced diet adequate in protein and calcium content should be provided, and vitamin D and strontium may be helpful adjuvant measures. Estrogen and androgen therapy are beneficial, particularly in postmenopausal and senile osteoporosis. Intravenous albumin deserves a trial in patients refractory to other measures. Use of orthopedic devices should be avoided whenever possible.

With such treatment one may expect relief of back pain and resumption of physical activity in the majority of cases within several weeks to months.

Current Concepts of the Process of Calcification

Much current research, as reflected by five recent Macy conferences,²⁹ has been devoted to problems in the structure and formation of bone. Although evidence thus acquired may lack immediate clinical application to the problem of osteoporosis, therapeutic progress ultimately rests on advances in our knowledge of bone metabolism.

The author will therefore attempt to summarize recent contributions to our understanding of bone physiology.

1. *Structure.*—Bone mineral comprises one third of the total bone mass. It is deposited diffusely as myriads of microcrystals measuring approximately $350\text{\AA} \times 300\text{\AA} \times 25\text{--}50\text{\AA}$ ⁸⁸ and giving an apatite lattice pattern on x-ray diffraction.^{44,76} These microcrystals are disposed in an orderly orientation⁸⁹ to correspond with fibrils of collagen, interspersed among which is an osseomucoid ground substance composed of complex mucopolysaccharides, including chondroitin sulfate.⁴⁴

The apatite lattice is a space arrangement rather than a formula. At least ten different formulas have been proposed for bone salt.¹⁵ At present the basic formula is conceived to be either hydroxyapatite ($3\text{Ca}_3(\text{PO}_4)_2 \cdot \text{Ca}(\text{OH})_2$) or hydrated tricalcium phosphate ($3\text{Ca}_3(\text{PO}_4)_2 \cdot \text{H}_2(\text{OH})_2$).³⁰ Disagreement over a correct formula may reflect the dynamic state in which bone salt exists and an inherent variability in its composition. This variability depends on two processes: absorption of additional calcium or phosphate on the apatite lattice, and substitution or surface binding of a great variety of ions.⁷⁶ Thus the composition of bone, within structural limits may vary in reflection of the composition of the blood as induced by diet.⁷⁶

Bone contains considerable CO_2 , approximately 5 per cent by weight. Whether this occurs as HCO_3^- or as $\text{CO}_3^{=}$ is not clear.⁷⁶ It has been suggested that $\text{CO}_3^{=}$ ions, by combining with the surfaces of bone crystals, cut off their growth, and thereby limit the crystals to the minute size which is responsible for the relatively large surface area in proportion to their mass.⁷³

2. *Formation of bone salt.* Much remains to be learned of the dynamics of calcification. The process was conceived originally as a precipitation of bone salt; however, no solubility product for bone has ever been demonstrated.⁵¹ Actually the concept of a solubility product is meaningless except in relation to a known and homogeneous solid phase of constant and comparatively simple ionic composition, which bone salt manifestly is not.⁷³ Furthermore, equilibrium is attained very slowly with hydroxyapatite, the results differ according to whether the state of saturation is approached from the direction of supersaturation

or undersaturation, and the relationships are influenced by such biologic factors as age and parathyroid function.⁷³

Within these limitations, it would seem that the product $(\text{HPO}_4=) \times (\text{Ca}^{++})$ represents a more reasonable precipitate than the fifth order reaction required by the product $(\text{Ca}^{++})^3 \times \text{PO}_4^{=}$.² In experimental studies of the calcification of rachitic bone in solutions of constant calcium concentration and variable phosphate concentration and pH, calcification occurred at points following the curve of the ion product of $(\text{Ca}^{++})^3 \times (\text{PO}_4^{=})^2$ on the acid side of pH 7.3, and following the curve of the ion product $(\text{Ca}^{++}) \times (\text{PHO}_4=)$ on the alkaline side of pH 7.3.⁷³ Against the biologic importance of such a reasonable early precipitate as CaHPO_4 , however, is the occurrence of calcification in individuals with blood calcium and phosphate levels below this critical K_{sp} .¹¹

To obviate difficulties encountered in the precipitation hypothesis, the concept of a catalyzed crystallization of bone salt has been advanced.⁷³ Catalysis is accomplished thus by a special surface of template which serves as a center or "seed" for crystallization. It has been postulated that the tissue or template absorbs calcium ions, which then attract and combine with phosphate ions, or conversely, that the first combination is with phosphate ions. There is insufficient evidence in favor of either theory.⁷³

3. *Bone matrix.*—Recent investigations of bone matrix are particularly germane in view of conventional concepts of osteoporosis. Studies on the relationship of the state of the matrix to calcifiability have suggested that calcifiability is directly dependent upon the state of polymerization or depolymerization of the mucopolysaccharides of the matrix.⁷³ Increased basophilia and metachromasia of the matrix surrounding cartilage cells have been correlated with calcifiability;⁹² in membranous bone formation²⁰ the situation is analogous. Of further interest, similar metachromatic staining of matrix has been noted in calcinosis universalis, calcified pericarditis, calcified bursitis, and renal stones of the calcium phosphate and carbonate types.⁹²

4. *Enzyme studies.*—With the vital importance of enzyme activity in a variety of metabolic processes well established, it is logical to relate enzyme

activity to the staining reactions and calcifiability of bone matrix.

Calcium salts deposit *in vitro* following the destruction of local enzymes only when unphysiologic concentrations are attained.⁴⁴ In the test tube (with the "local mechanism" absent) phosphate added to serum does not form bone mineral, but rather, when a critical ion product is exceeded, a colloidal form of calcium phosphate appears.⁷³

The association of alkaline phosphatase with osteoblastic activity suggested that this enzyme plays a role in calcification. Robison⁹⁰ originally thought that phosphatase cleaves an organic phosphate bond, thereby elevating local phosphate concentration and causing a crucial ion product to be exceeded. However, the optimal pH for this enzyme is high (9.4), the concentration of suitable substrates in the body fluids low, and other non-calcifying tissues are rich in an identical or similar enzyme. Furthermore, although phosphatase activity is associated with the hypertrophic stage of cartilaginous proliferation, it is not found in bone matrix, either calcified or uncalcified.⁷³ And since either iodoacetate or fluoride in concentrations too low to inhibit alkaline phosphatase activity can inhibit calcification of cartilage, a "second mechanism" had to be postulated.⁹¹

Histochemical techniques demonstrate an intimate relationship in distribution between alkaline phosphatase and mucopolysaccharide. This suggests that enzyme plays a part in the formation of the ground substance, perhaps conferring the property of calcifiability upon the matrix. Once the matrix is calcifiable, phosphatase activity is no longer essential for the calcification process.^{43,72} Direct evidence on this hypothesis is not yet available.⁷³

The role of other enzymes in the calcification process has been scrutinized following the demonstration that glycogenolysis is prerequisite to the calcification of cartilage.^{44,45} In healing rachitic cartilage, mineral deposition was noted only in the matrix immediately adjacent to glycogen-containing hypertrophic cells.³⁶ In normal tissue, the glycogen deposits in hypertrophic cartilage cells disappear just prior to or during deposition of bone salt in the cartilage matrix.⁴⁵ Gutman and Yu⁴⁶ have demonstrated that at least the enzyme systems necessary for phosphorylative glycogenolysis play an important role in the mechanism

of endochondral calcification, constituting part of the so-called "local factor." Using phlorizin, iodoacetate, and fluoride to block phosphorylase, 1-3 diphosphoglyceraldehyde dehydrogenase, and enolase respectively, utilization of organic phosphate sources occurring prior to the blocked step in the glycogenolytic pathway was prevented; phosphate sources appearing in the cycle after the block could be utilized.

The steps involved after phosphopyruvate remain obscure. Perhaps a transphosphorylation is involved with transfer of the phosphate of high-energy phosphopyruvate to some unidentified acceptor, which might be the ultimate (still unknown) substance in cartilage matrix undergoing calcification.⁴⁷

Studies on beryllium,⁴⁷ which specifically inhibits alkaline phosphatase, are difficult to interpret because the concentration of beryllium and of various substrates tested are of critical importance. At crucial concentrations, inhibition of calcification occurred when phosphate was supplied as B-glycerophosphate, sodium phenylphosphate, or creatine phosphate. Calcification was not inhibited when inorganic phosphate was supplied; the inhibition of utilization of glucose 1-phosphate, glucose 6-phosphate, and fructose diphosphate could be overcome by raising substrate concentrations. Gutman and Yu⁴⁷ concluded that the enzyme mechanisms involved in the utilization of inorganic phosphate for endochondral calcification differ significantly from those operating in the utilization of B-glycerophosphate and other phosphoric esters which are not in the glycogenolytic series, but which are dephosphorylated by alkaline phosphatase.

The role of enzyme systems in the process of calcification undoubtedly represents a fertile and important area of investigation in this field. Nevertheless, no conclusive evidence has been presented so far that a specific enzyme system is required for the calcification of bony matrix as distinguished from cartilaginous matrix.⁷³ To quote Gutman: "No system of calcification yet proposed takes into sufficient account the important differences disclosed by histological and histochemical study in endochondral calcification, endosteal calcification, and periosteal calcification, nor has any satisfactory mechanism been suggested to explain the complex and diverse actions of the various hormone and vitamins."⁴³

Comments and Discussion

Although the concept of osteoporosis as a deficiency of bone matrix fits the clinical picture of the disorder and its response to hormones which stimulate anabolic processes, it has been difficult to understand the positive calcium balances produced by dietary measures alone. The variability of bone salt composition and the demonstration that the apatite lattice can adsorb or exchange ions from the surrounding medium offer a possible explanation. Although factors influencing calcium absorption are not completely understood, and individual variations are difficult to explain, it seems possible that calcium supplements might increase absorption, produce a transient rise in serum calcium levels, and thereby promote adsorption of additional calcium by bone salt crystals. Increases in bone calcium content too slight to be detected histologically or roentgenologically could perhaps nonetheless cause symptomatic improvement. Thus better-than-adequate mineralization might compensate in part for less-than-adequate matrix. Such a concept could also account for the beneficial effects of strontium therapy.

From their synergistic effect on calcium retention, it is clear that estrogen and androgen possess different mechanisms of action. By analogy with other hormones with known mechanisms of action, it is plausible that gonadal steroids affect the skeleton through acceleration or inhibition of enzymatically controlled reactions. Changes in enzyme concentration occurring in tissues and organs under the influence of hormones can be correlated with changes in their function and with the level of the hormone acting on the end organs. This conclusion is well illustrated by the changes in the alkaline phosphatase, acid phosphatase, adenosine triphosphatase, succinic dehydrogenase, malic dehydrogenase, and total glycolysis of the corpus lutea of the rat during pregnancy and lactation.⁷⁵ No single generalization, however, will serve to describe the changes in enzyme concentration which follow induced hormone deficiencies.⁷⁵

Speculating further, idiopathic osteoporosis and osteogenesis imperfecta may represent a lack of an enzyme concerned in osteogenesis. Absence of such an enzyme might account for failure of hormonal therapy in these cases; yet substrate (? albumin) occurring after the blocked reaction might be utilizable for matrix formation.

For this reason the author finds current research on enzymatic activity in endochondral calcification most challenging. At present the crucial enzymes involved in human endosteal bone formation are not known. Alkaline phosphatase has been related to bone matrix formation and calcifiability only circumstantially. It is hoped that further investigations will disclose the biochemical reaction involved in matrix formation, the enzymes whose presence is required, and the nature of hormonal influences on these enzymes.

Summary and Conclusions

Osteoporosis is a clinical syndrome of bone demineralization, probably resulting from a deficiency of the bone matrix. It is often associated with metabolic disturbances characterized by decreased protein synthesis or increased protein breakdown. In view of present knowledge of hormone and enzyme activity and of recent studies on the enzymology of calcification, it is hoped that further study will demonstrate enzymatic processes involved in bone matrix formation and provide a more rational basis for hormonal therapy.

Therapy, though empirical, is nonetheless often successful. Through mechanisms not entirely clear supplementary calcium, vitamin D, and strontium increase mineral retention and often produce symptomatic improvement. Gonadal steroids also produce calcium retention, probably through stimulation of osteogenesis, and are usually the therapeutic agents of primary importance.

In the relatively few cases where this is possible, the clinician should treat etiologically. In the great majority of cases, he can merely hope to provide the dietary constituents requisite to bone formation and stimulate utilization of these raw materials through intelligent steroid therapy.

As the most common systemic disease of bone, osteoporosis is of major clinical importance in itself. Even more important, investigation of the clinical problems presented has in turn furthered our understanding of hormonal relationships and basic bone metabolism. Recently acquired knowledge of enzymatic activity points the way to future fruitful investigations. It is hoped that knowledge about bone matrix formation gained from studies in relatively uncomplicated osteoporosis may in turn contribute to our understanding of more complex problems in bone disease, such as Paget's disease. One might speculate further that processes crucial to bone matrix metabolism may be

common to other connective tissues, and that the knowledge acquired of osteoporosis may bear clinical fruit in the vast area of the "collagen diseases."

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Current Concepts

Changing Concepts in the Treatment of Tuberculosis

"Plus Ça Change, Plus C'Est La Meme Chose"

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London, England

Tuberculosis is a general disease with local manifestations. Recovery depends more on what the patient has in his head than what he has in his lungs.

Sanatorium treatment is essential. It combines necessary bodily rest in open-air conditions, with mental rest away from the worries of home and work.

Graduated exercise to produce auto-inoculation is the only way to prepare for return to life in normal conditions.

The best hope for the patient is to remain under sanatorium conditions in sheltered work.

There is no treatment like artificial pneumothorax, but it should be carried on for the first six months in a sanatorium. Thoracoplasty is a last hope.

It is not necessary to go to a sanatorium for induction of pneumothorax. After a few days in hospital the patient can return to work and continue refills as an outpatient.

Pneumothorax is a long treatment with many possible and dangerous complications. Thoracoplasty is a safer and shorter cure but should be carried out under sanatorium conditions.

Every patient should get back to work as soon as possible.

Sanatorium treatment and collapse therapy are no

longer necessary. Cure can be effected by antibiotics alone which can be given either at home or at a clinic.

Resection is the treatment of choice; it removes the disease entirely and makes rehabilitation unnecessary.

Rest treatment is outdated.

Victory over tuberculosis is in sight.

There are valid doubts whether the disease can ever be banished by specifics even more potent than any now in use.

Resection should not be done until the patient has six months treatment with antibacterials in a sanatorium.

Victory, my foot! Success is not victory, and its criterion in tuberculosis is morbidity not mortality.

Tuberculosis is still a general disease; a clearing x-ray is not the same thing as a cure.

Tuberculosis has become a chronic disease instead of a killing disease. Its modern treatment is creating huge financial problems in after-care that threaten to ruin our medical economy. Every patient should have rehabilitation.

The right treatment is to prevent morbidity by excising primary lung foci and glands, or by giving B.C.G. to all negative reactors.

It is time to get back to treating the patient with disease instead of treating the disease and the bacillus.

THESE statements, which are more or less in chronological order, summarize the experiences with changing concepts of treatment of the chest physician who has been in practice for the past thirty years. Every few years he has seen the emergence of some new panacea, which with time has either lost favor or been modified in its application for various reasons—disappointment with results, advances in surgical technique, war conditions, postwar bed shortage, the changing pathogenesis of the disease, the introduction and general use of antibacterial agents, the increase in the number of the living tuberculous, and continuing morbidity have all played their part.

Throughout the period it is possible to recognize two main trends of treatment: First, a swing away

from treatment directed to the needs of the individual patient, through stages of concentration of his disease, then on his x-ray findings, and latterly on the tubercle bacillus; second, a swing back to the treatment of the individual, led by the psychologist and the neuropsychiatrist, who have been disturbed by the rebellion of the patient against a fixed and impersonal routine. Osler believed the mind even more important than the lung lesion in treatment; today the psychosomatic aspect of pulmonary tuberculosis is being stressed.

Changing concepts are well illustrated in changing attitudes to sanatorium treatment. Reasoning against it over the last ten years may have been practical in the light of postwar difficulties, but it cannot be claimed as being entirely logical. The

after-history results of the 1920's, which appeared within ten years of the general introduction of rest and graduated exercise as the one hope for the tuberculous, were the only results then possible. The sanatorium of those days was trying to make bricks without straw; it consisted of a good middle span of treatment with no supporting ends, since on the one hand some 80 per cent of its admissions were in stages II and III of the disease, and, on the other, it was entirely powerless to implement its advice on the future to those who were fortunate enough to survive to a date of discharge. The recent tirades against it ignore the fact that 90 per cent of stage I cases treated in the 1930's could count on efficient arrest of their disease through the application of graduated rest and the sensible use of medical collapse-therapy. They forget, too, the part it played in the prevention of contact infection, especially in the home; contact infection in industrial life today is a serious problem, to which the loss of residential training is a contributing factor. To cite only the expected failures of the sanatorium savors of opportunism, and of an eagerness to find a new virtue in the necessities of the postwar difficulties of bed-accommodation.

The same illogical reasoning has been apparent in arguments against the use of artificial pneumothorax. Years before it was decried for the incidence of its complications, these had been very materially lessened. X-ray control from the day of induction, and thorascopy where indicated, were generally used. A useless pneumothorax was quickly discarded; for twenty years no physician has talked glibly about "selective collapse." The days of pyo-pneumothorax resultant on cutting adhesions that contained lung tissue are long past. End-results are almost universally excellent where the patient has one physician throughout his treatment and does not receive his refills at any clinic that happens to be convenient, just as if he were merely attending a tire-pumping station.

By 1950 both sanatorium treatment and collapse therapy, medical and surgical, suffered from the dramatic immediate effects of antibiotics and resection, for both were dependent on bed-treatment, and bed-shortage was the outstanding problem. For this shortage some blame must go to ill-conceived propaganda on the dangers of infection used to induce the public to attend mass-radiography centers; it frightened prospective nursing and domestic staff away from employment which

was known to have the lowest incidence of morbidity from phthisis.

Both forms of treatment suffered also from changing ideas on the value of rest treatment. The necessity for wartime production had brought a renewed interest in rehabilitation. In Great Britain grants-in-aid in money and in kind had been made dependent on willingness to get back to some form of work. Although Marcus Paterson's theories on the value of auto-inoculation by graded exercise had been dead for almost twenty years, the ultimate uselessness of a static life was again preached. The new trend was markedly accelerated when pictures appeared in the medical and lay press of patients dancing within a few weeks of starting specific drug therapy. Now that there is no pressure on sanatorium beds many younger physicians are rediscovering the value of rest; there is a return to belief in its benefits during the early stages of antibiotic treatment up to one year, and both before and after the operation of resection.

Knowledge of the changing pathogenesis of phthisis owes much to the increased use of x-ray examination by large and miniature films. Before the outbreak of World War II, however, and therefore before the discovery of streptomycin, there was already evidence of a growing resistance to established disease; and of a growing response to treatment. The death rate was falling steadily, if slowly; by 1948, the prewar position had been recovered in North America and Western Europe. By the mid 1920's, fulminating forms of the disease were disappearing. By the 1930's, complications, such as laryngitis and abdominal disease, were less frequent, and a growing number of patients with cavitation were becoming chronic carriers into old age. On the other hand, the rounded, "Assmann's" focus which became rare in those days is appearing again as the "tuberculoma," which can remain apparently inert for a considerable period under antibacterial treatment and yet produce fresh foci in the lung fields, and x-ray examination of the supposedly healthy discloses hitherto unrecognized forms of adolescent primary disease.

Undoubtedly, this changing pathogenesis had played a part in the dramatic effect on the death rate of the general introduction of the new antibacterial agents in 1948; in England and Wales in 1955 deaths totaled 6,492 as against 19,908 in 1949. This result, however, has presented us with new problems. A rapidly falling death rate has

naturally been accompanied by an equivalent rise in the living rate. The number of cases on clinic registers has reached alarming totals. In England and Wales in 1955 the number was 342,866, an increase of 70,826 since 1949.

Not all of these clinic cases will become sputum-negative, and not all who do so will remain permanently negative. That there is a sense of false security by faith in antibiotics is shown in a recent report of the Chief Medical Officer of the Ford Motor Company at Dagenham; of eighty-two men returned from clinics as fit for work, fourteen were found to have positive sputum, and in another series of seventy-eight, many of whom had been removed from the registers as cured, practically 60 per cent were positive to periodic sputum examination. If falling mortality is to mean remaining infectivity in a growing number of workers in open industry, this is a poor present to the community. There must be more rigorous follow-up for several years of all cases who have at any time returned a positive sputum. We may yet have to reopen sanatorium beds for the segregation of carriers.

Unless such stringent measures are employed, our notification rates and tuberculin conversion rates will not fall in proportion with our death rates. So far in the United States the fall in notifications is only some 3 per cent, per year; in England the number notified in 1955 was 38,134, a fall of only some 15 per cent, against the 65 per cent fall in the death rate since 1949. Our infant and childhood rates of infection have been falling since 1938 with the greater use of pasteurized milk, but 25 per cent of our population become tuberculin-positive between the ages of fifteen and twenty, and the forward age-shift of tuberculinization is being reflected in the increasing number of breakdowns in men aged forty-five to fifty.

These facts are forcing new concepts of treatment aimed at the prevention of morbidity. The recent Medical Research Council trial of B.C.G. and vole-bacillus vaccines in negative-reactors between the ages of twelve and fifteen resulted in the claim that they can reduce morbidity in early adolescence by some 4 per cent. Some surgeons are now advocating resection of tuberculous hilar glands and primary lung foci, and some physicians are asking just how minimal tuberculosis

of the lung has to be before one would not treat it by chemotherapy.

Among the increasing number of survivors, there is an increasing number of disabled. The latest returns of registered disabled in Britain show that the percentage of those disabled by phthisis is exceeded only by that of persons disabled by limb injuries. About one fifth of them are seriously disabled and wholly dependent on state grants. Where antibacterial treatment has made a chronic illness of a killing disease, it is ultimately a failure; the true end of treatment is to return the patient to work in the community of his fellows. Unless rehabilitation and vocational training are recognized as part of treatment and not merely placebos of post-treatment, we shall place an ever-growing load on the State, which will get no return in services at economic ages.

The latest concept of treatment is the psychosomatic. Neuropsychiatrists maintain that as recognized precipitating causes of morbidity in malnutrition and bad hygiene disappear with social services new factors are coming more into evidence in personal reactions to the stress and strain of modern life. This is really a complete turn of the wheel of concepts, not the new speciality some writers would claim it to be. It is none other than the concept expressed forty years ago by Osler as an essential for the physician who would treat his patient as a whole, again forced into the forefront because the individual resents treatment by rule of thumb, however sound this rule may be in its scientific basis.

The lesson of thirty years of the experience of concepts of treatment is evident. Medicine is not, and is never likely to be, based on exact science; it remains an art, because the personal side of the patient has changed little during the five thousand years of medical practice. This art requires experience, difficult to acquire by didactic teaching, and gained only by the sympathetic study of the total family, social, spiritual and medical background of the man who is ill. In its application all concepts of treatment are combined into one treatment; preventive measures, rest, collapse therapy, resection, antibacterials, and industrial and psychologic rehabilitation each take their proper place, because the aim is to deal with the individual requirements of the individual patient.

Continuation Study

A New Technique for the Diagnosis of Intestinal Obstruction

JOHN F. PERRY, JR., M.D., and
STANLEY L. VON DRASHEK, M.D.

Minneapolis, Minnesota

SIMPLE intestinal obstructions can be managed today with a reasonable mortality rate. However, strangulating lesions of the bowel causing obstruction are still formidable clinical problems because of the difficulties in diagnosis and the lethal character of such obstructions if not recognized and treated promptly by operation. An analysis of the experience of the University of Minnesota Hospitals has shown that the mortality rates accompanying strangulation obstruction are three to four times as great as those with simple obstruction. Neither clinical nor radiographic findings are uniformly positive in strangulation obstructions.

Laboratory experience has shown the edematous or hemorrhagic loops of experimental strangulating obstruction which are venous or predominantly venous in character can be readily visualized by x-ray after induced pneumoperitoneum. Such obstructing lesions could be diagnosed less often by conventional radiographic techniques.

Pneumoperitoneography has now been used in a sufficient number of patients with intestinal obstruction so that we feel it offers a definite aid in recognition of strangulating lesions causing obstruction.

By the use of this method the diagnosis of strangulation obstruction has been made in some patients who presented clinical and radiographic findings of simple obstruction only. In others, suspected of having strangulation obstruction, it has given confirmation of the diagnosis by demonstration of the lesion.

Pneumoperitoneum is induced by passing a short

bevel #15 gauge needle through the abdominal wall in the right lower quadrant or some alternate site on the abdominal wall. As soon as the parietal peritoneum is penetrated, a small bore polyethylene tubing is threaded several centimeters into the peritoneal cavity and the needle withdrawn. Air is introduced manually by a syringe and three way stopcock. About 600 cc. of air usually suffices. After introduction of pneumoperitoneum abdominal x-rays are taken in the supine, Trendelenburg and upright positions. The supine pneumoperitoneogram has usually provided the most information. After x-rays have been made, most of the air can usually be removed by aspiration through the polyethylene tubing if desired and the tubing then removed.

The exact indications for pneumoperitoneography in intestinal obstruction cannot be definitely stated at this time. It has been most useful in patients suspected of having intestinal obstruction whose abdominal x-rays appear gasless or nearly gasless. If conventional abdominal x-rays show a "pseudo tumor" sign or gasless area suspicious of a mass, pneumoperitoneography may confirm the presence of a strangulating lesion. We have used it whenever the diagnosis has been in doubt. It should probably not be utilized, however, in the presence of great distension of many small bowel loops.

The potential dangers from puncture of bowel and other viscera, air embolism, or the introduction of air into the acutely inflamed abdomen are recognized. We believe the advantage gained in the diagnosis of potentially lethal strangulating obstructions outweighs these disadvantages.

Summary of paper presented at the University of Minnesota Continuation Course for Surgeons, Minneapolis, May 25, 1956.

Editorials

JOHN F. BRIGGS, M.D.
ARTHUR H. WELLS, M.D.
HENRY G. MOEHRING, M.D.

TODAY'S APPROACHING CRISIS

Many of the problems of medical practice today stem from the public's lack of awareness as to what is the purpose of medical practice. There are times when we physicians have to pause for a moment before we are able to answer this question. We tend to take what we do daily for granted, so that it becomes difficult to express specifically in words what actually are our activities. If we cannot clearly analyze our own work, then it becomes impossible to expect a less informed public to be able to do so. It is for this reason that I raise the question, what is medicine? Or specifically, what do we sell to the public? Is it good health? Any physician of experience will deny that good health is our commodity, although we hope this will result from our efforts. Do we sell prescriptions or physical examinations or various diagnostic procedures or operations to the public? The answer is no, although a significant proportion of the nonmedical public might disagree with this.

What, then, is medicine? To me medicine is decision. It is a decision based on experience, judgment and training, and, once arrived at, it is decision that is acted upon. Decision will always be the common denominator for every type of medical practice, and any physician who cannot reach a decision fails in the effective practice of medicine. The only commodity that we have to offer the public is decision.

It would seem that the above premise is self evident. However, my experience makes me believe that this is not so. It is my contention that much of organized medicine's difficulty in public relations stems from the fact that the general public regards the physician as a dealer in "things" rather than "ideas." We may not like this attitude; however, not liking it does not make it less true. The physician of generations ago did not have the antibiotics, antihypertensive drugs, the "tranquilizers," or the modern techniques in the diagnosis and treatment of disease, so that the patient consulted him for his opinion relative to his subject. Today, the well informed modern patient believes that penicillin is good for his

"cold," that rauwolfia will cure his high blood pressure, that Equanil will sooth his nerves, and so he consults his physician with the attitude that the physician is the "middle man" in our present scheme of therapy. This is not only a dangerous state of affairs to organized medicine but more so to the general public.

It is my opinion that this situation results from our failure to carry out our responsibility in the education of the public. This, of course, may be due to our failure to remember our true function. The fault, however, is not ours alone. There are many strong socio-economic forces which are inadvertently and directly educating the public in the opposite direction. One of these forces is represented by our present system of health insurance.

I do not wish to imply that these various forms of health insurance are undesirable. On the contrary, such insurance programs have benefited the public. The insurance designers and planners must be congratulated for bringing these programs to their present state of development. The administrative task in the beginning was most difficult. It is almost impossible to imagine the problems encountered in setting up risk tables without the assistance of previous actuarial experience. It is also recognized that for this reason most of these programs developed their basic concept in and around the tangible aspects of medical practice. The result was a specific alignment of these policies along diagnostic procedures, surgical procedures, and the like. Unfortunately, the insurance plans do not recognize the value that must be placed on the most fundamental feature of the practice of medicine, namely, the ability to make a decision and to carry it out for the benefit of the patient. These plans as a result do not specifically evaluate the time and the energy that is necessary to reach such decisions. It is imperative at this time for the future of medical practice and the well being of the public that this oversight be corrected. It must be emphasized that value be placed on ideas as well as on things. We must insist that these changes be made for without them the true function of the physician will be

forgotten and he will truly become the "middle man in therapy." The insurance plans have played an important role in the education of the public concerning medicine. These plans can be a most potent force to influence the modern practice of medicine. The rapid growth of the voluntary companies as well as the reference to compulsory health insurance in the various political campaigns, as well as the increasing demand for broader and broader coverage in labor contracts, attest to this fact. Since this is true, it would seem only reasonable that we define our function clearly and definitely in our own minds and insist that this function be recognized by all. If we fail in this task, others will define this function for us. If this should happen, both organized medicine and the public which it serves will ultimately suffer.

B. F. FULLER, M.D.

THE TEACHING OF SCIENCE

An important activity of the Minnesota Science Teachers' Association deserves the attention and support of all physicians in our state. This association has done an outstanding job in improving the teaching of the sciences in Minnesota high schools, and its program for attracting larger numbers of able people to this field appears to be promising.

A committee of the association, the Business, Industry, and Teachers of Science Committee (BITS), is sponsoring a Science Teacher's Conference on Friday, May 3, 1957. In order to make possible maximum attendance at the conference by high school teachers, BITS urges the professions and industry to help by making their members and scientists available as substitute or guest teachers in the various high schools on the day of the conference. Thus, a physician might take over a biology or general science class, and a chemist or engineer a chemistry or physics class, freeing the teacher in each instance so that he might attend the Conference.

High school teachers themselves and members of the BITS Committee will communicate with members of the various professional groups concerning this program. Physicians who wish to volunteer their services for this purpose may do so by writing to the principal of their local high school or to Mr. Martin Thames, Secretary of BITS, Bemidji High School, Bemidji, Minnesota.

The physicians of our state are fully aware of the importance of good teaching of scientific subjects in the secondary schools. We are certain that they will welcome this opportunity to be of service in a small but significant way.

ROBERT B. HOWARD, M.D.

RECEPTIONIST VS. TELEPHONE

Dr. Jones' office was full of fidgety people, all glaring—at each other, somewhat, but mostly at Susie Smith, receptionist, who tried to soothe everyone's impatience with periodic announcements that Dr. Jones had been delayed at the hospital but that he expected to be able to leave for the office very shortly. As if it wasn't bad enough to have to listen to the ululations of the people in front of her, poor Susie had to answer the phone, too, and it would choose this day, of all days, to ring its fool head off.

"If that phone rings once more," she mumbled to herself, "I'll tell the person who's calling to go jump in the lake!"

The phone rang. She curbed her impulse to suggest a dip in the drink, thanks to a friendly little gremlin somewhere in the back of her mind who reminded her that she liked to eat and buy a new hat once in a while, and answered the phone in usual fashion. Well, almost. Ordinarily, Susie put all the honey she could muster into her voice when she answered the phone, but on this occasion it was just too much to be pleasant on top of all that had happened. So she let slip a very abrupt:

"Hello!"

Her tone of voice was so chilly the temperature in the room probably lowered a degree or two. . . .

This little episode ends right here. But it's interesting to imagine the reaction of the person at the other end of the line to Susie's abrupt brush-off-type telephone reply. Had the caller happened to be her employer, she might have been in for a mild reprimand. (Not that Dr. Jones himself doesn't get abrupt on the phone once in a while.) If the caller happened to be someone who really was or imagined that he was seriously ill, an answer like the one Susie gave might have been all that was necessary to touch off a vision in the mind of that person of a mean old doctor telling him that whatever was ailing him was a fatal-type illness and that he could be expected to be patted in the face with a spade before too long.

All of which is a means of saying that being abrupt on the phone is to no one's advantage, no matter how you look at it. Or, to be positive rather than negative, telephone courtesy in the doctor's office is extremely important since a good majority of the people who call are probably somewhat upset, and a nice, sincere, sympathetic-but-not-sickeningly-sweet voice helps take the edge off the patient's anxiety.

For whatever it's worth, then, here are some suggestions for all the Susie Smiths everywhere on using the telephone in the physician's office: Answer promptly, greet the caller pleasantly, identify yourself and your office when you call or answer, give the person who's calling time to say whatever he or she wants to say without interrupting, use a friendly but natural tone of voice, speak distinctly (you can't do this with gum in your mouth, Susie), and try to take a personal interest in the caller's problem. To sum it up: Be as personable on the telephone as you would be face-to-face.

NORTHWESTERN BELL TELEPHONE COMPANY

THE WHITE SLAVES OF NEO-SLAVONIA

The rest of the household had gone up to bed. My host thoughtfully replenished both our glasses and settled himself comfortably.

'I suppose you have heard how we have dealt with our Social Evil in Neo-Slavonia?' he asked with a chuckle, 'What do you think of it?'

I confessed that I knew nothing whatsoever about it.

'What!' he slapped his knee, 'haven't you heard? Oh, I must tell you, then. You'll love this.'

'Every now and then we would have outcries against the prevailing laxity of morals, as I expect you do. Bishops, judges and newspapers suddenly wake up, and there's a to-do, and then it all dies down again. The last time it happened, our Prince suddenly took action.'

He laughed immoderately.

'I really ought not to laugh,' he said apologetically, 'but it really was superb. I ought not to be saying this either: but I just cannot make up my mind whether our sovereign is a knave, a fool or a genius. He certainly has the devil's own luck with his Anglophile projects. As usual, he said, "What would the British do?" and before you could say Johann Nosnibor he had inaugurated a Ministry of Masculine Entertainment,

extracted a weekly contribution from every male between the ages of sixteen and eighty-six, and by the subtlest propaganda persuaded all the geishas to be nationalized. There was supposed to be Free Choice, but every male was put on one Nominal Roll or another to begin with. The geishas were allowed to have up to a thousand—or was it two thousand?—names on their lists at a capitation fee of twenty schillings per annum. A nice, steady, assured income, what? . . . Guess what happened?'

'I really cannot conceive,' I replied, 'I've never heard of anything like it.'

'Well, these poor girls got no rest—apart from the statutory day and a half off each week and a four weeks' leave each year. Otherwise, they were on call twenty-four hours a day. It didn't work out quite so badly as that, of course; but they could never be sure of any leisure. And sooner or later a lot of chaps, who otherwise would never have dreamed of calling upon their services, were saying, "I've been stamping my cards now for months and months without getting anything out of it. What about it?" Perfectly natural: just what one would expect.'

'The next thing was that the General Duties Geishas got a bad name for indifferent service. Poor dears, they simply had no time or energy to give really personal attention.'

'Yes, I can see that,' I said, and quoted sententiously—"That individual attention which is expected from all professional men and women, and which professional men and women take pride in giving." Carlyle, wasn't it?'

'I don't know. At any rate, they couldn't. Nobody can when they are metaphorically rushed off their feet. And then, as I told you, we had this Nationalized Litigation Scheme, and that added to their worries. True, all costs and damages are paid by the State, but the publicity of a court case is bad.'

'But what happened to private practice?' I asked,—'Surely it must have enjoyed a terrific boost—or was it made illegal?'

'Not quite: every possible obstacle was put in its way, however. Oddly enough, it fell off considerably. People said, quite reasonably, that they weren't going to pay twice. No. There was much more cunning moves. A hierarchy was established

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within the Service: specialist appointments with shorter hours and higher pay, merit awards—you'd never believe the scramble to get into administrative jobs, the applications to Take Silk, and advertisement of posts and the shortlist parades.

'There is one very happy result: no geisha encourages her daughter to follow in her footsteps. They put them into uniform. Domestic service usually; failing that, Medicine.'

'But did the geishas take this lying down, as it were?' I asked.

'Most of them followed their leaders—who were already in administrative jobs—like so many sheep. Every now and then a few reactionaries hold indignation meetings, but it does them no good. There was one the other day in this very township. They moved a resolution deploring the manner in which their profession has been—I don't know the English equivalent. They use a Neo-Slavonian expression which I fancy has a different meaning with you. They say their profession has been *doctored*.'

'No. We only apply that phrase to neo-Tom Cats.'

PETER QUINCE

THE MINNESOTA HUMAN GENETICS LEAGUE

The Minnesota Human Genetics League held its first annual meeting on November 14, 1945. It is remarkable that there were forty-seven charter members and that, as far as is known, none of them was a holdover from the old Minnesota Eugenics Society. Apparently Dr. Minnich, the president of the new society, was not a member of the old one. Although the Dight Institute and its Advisory Committee helped organize the Minnesota Human Genetics League, the two organizations are legally entirely unrelated. The University of Minnesota had thus fulfilled the fourth and final requirement of the Dight bequest by establishing the League. The University was not obligated to guarantee the survival of the League and it was anticipated that the five officers, who were all University professors, would be replaced as the years passed by persons outside the University. The secretary is the only University of Minnesota staff member among the five officers serving in 1956.

One of the functions of the League is to augment and encourage the activities of the Dight

Institute and to interpret human genetics to the physician and the public. Thus while the two organizations are legally independent their programs are functionally parallel.

In 1946, the League suffered a crisis due to the departure of its secretary, Professor C. P. Oliver. At its third annual meeting in 1947 there were only fifty-six members in good standing. It is the secretary who rounds up the new members and prevents the old ones from falling away, once the organization has been established. In 1947, a new director for the Dight Institute and secretary of the League was found. The new man, Sheldon C. Reed, like his predecessor, could not devote much time to membership recruitment, but gradually the League grew so that there are now about 125 members.

The source of strength who has determined its policy, and has given the League its status, has been the president, Professor Dwight Minnich. He served as president of the League for the first decade of its life and last year resigned the office in accord with his belief that rotation of office has merit in itself. He was succeeded by Dr. John S. Pearson of the Rochester State Hospital who brings many talents to the League.

There can be no doubt that if Dr. Dight could return today he would be elated at the growth, stability and progress made by the League under the guidance of Dr. Minnich. He would realize that his investment had paid high dividends. Indeed, as none of the financial return from the Dight trust is utilized directly by the League, the canny old doctor is coming as close to getting something for nothing as anyone could.

It is, of course, the accomplishments of the League that would intrigue Dr. Dight. They are probably somewhat different from what he might have predicted. At any rate, we are ready to review them at long last.

SHELDON C. REED

LIBRARY FACILITIES AT OUR MEDICAL SCHOOL

The staff, residents, interns, and medical students at the University of Minnesota Medical School all feel a need for a new library near the medical campus. The distance separating the present University library from the medical school

This is the fifth in a series of articles on medical students at the University of Minnesota.

has long been a handicap. In a sense, as new buildings are built for the medical school, and as living units for medical students are moved further from the main campus, this distance is becoming even greater.

Medical students are keenly interested in this problem. They find that they have only an occasional hour off between classes in which to study. The time it takes them to get to and from the main library cuts down their study time so much as to often be prohibitive. A few years ago the Medical Student Committee was able to increase the library privileges of medical students and thus render actual time spent in the library more useful. However, this did not solve the problem.

The Medical Student Committee, therefore, became very interested last year when the Minnesota state legislature considered appropriations for a medical library. In fact, Dr. Dennis Kane, then president of the Committee, met with the legislative committee to plead our cause. That legislature finally appropriated almost half of the requested sum, provided that the Federal Government match this sum, according to a bill being considered in Washington. That same bill, though it did not pass last year, is again being considered this year.

The medical students hope to have a large medical library conveniently close to the medical school. We hope to have a library that is open relatively late in the evening as opposed to the present hours of the main library. It is felt that such a library would also fulfill the need for study space for medical students.

At the present time, the main University library does not meet the needs of students, interns, residents, or staff members of the medical school. Nor do the occasional small departmental libraries in the hospital add much to fulfilling those needs. The fate of a medical library again lies with a group of legislators. We hope that they will realize the need.

RALPH B. SWANSON

LIGHTING THE DOCTOR'S OFFICE

The Doctor's Private Office.—A second area to be considered is the doctor's office or consultation room. Here, the patient and doctor meet—often for the first time. It is important that the lighting

be designed to encourage confidence and peace of mind in the patient and still maintain an atmosphere of professional dignity without becoming "cold" or commercial. General illumination and ample light for the physician's desk are the functional requirements.

A combination of ceiling illumination and portable lamps is a practical solution. The ceiling lighting may be fluorescent, either recessed or surface mounted. Care must be taken to use proper shielding. Plastic or glass panels are favored.

If recessed troffers are used, one should be placed directly over the doctor's desk and another at the other end of the room, providing the area is large enough to require two units. Twelve feet in room length is minimum size.

The same arrangement may be used for surface mounted lighting equipment, but greater care should be exercised in proper shielding to reduce direct brightness from fixtures.

In addition, one or two portable table and floor lamps can do much to soften the general appearance of the office and provide a more comfortable, relaxing atmosphere.

The Examination or Treatment Room.—In the examination or treatment room, atmosphere and aesthetics are secondary. Function is all important. And lighting should be designed accordingly.

Since this is the doctor's "work area," a colorful decor is unnecessary, and walls can be painted white for highest light reflectance. Thus, a somewhat higher light level is provided without increasing wattages.

With the emphasis on efficiency, overall lighting calls for a high level of diffused, "shadowless" illumination which has reduced glare to a minimum. A seventy-five foot candle level is usually adequate.

Fluorescent fixtures, recessed if possible and not more than 6 feet on center, are recommended. A room 12 by 12 feet, for example, would use four troffers, each 4 feet long and containing two 40-watt T/12 fluorescent lamps. The same arrangement could be used for surface-mounted fixtures, but unlike those in the doctor's private office, they should be of the direct lighting type rather than indirect or semi-indirect in character.

In addition, the room will probably be fitted with one or two examination lamps peculiar to the field in which the doctor has specialized. Many also find one incandescent spotlight, ceiling

This is the second of two articles on the subject of office lighting.

mounted on a flexible shaft or stem, most helpful in a variety of ways.

Lamp Colors.—Although subtle to the eye, both fluorescent and incandescent lamps come in colors, and their proper use can accomplish much both psychologically and functionally.

There are seven fluorescent and two incandescent bulb colors from which to choose. Fluorescent lamps come in standard cool white, deluxe cool white, standard warm white, deluxe warm white, white, daylight, and soft white. Incandescent lamps come in white (or the ordinary inside frosted bulb), in pearl pink as in the new Softlight bulbs, and also a new Cool-light which is slightly bluish in character.

These lamp colors give different effects and offer many different uses. For example, in the reception room, the new Softlight bulbs produce a warm, friendly light which contributes to a homelike atmosphere and the comfort of waiting patients. Recommended are 75 to 150 watt sizes or the three-light in equivalent wattages.

In the doctor's office, deluxe warm white fluorescent lamps are recommended for ceiling fixtures. They are richer in the red rays than most fluorescents and thus more flattering to both people and furnishings. Super white incandescent bulbs of the proper size for portable floor and table lamps are easy on the eyes.

For the examination room, cool white fluorescent lamps are most efficient. They have no predominating color characteristics and are thus ideal for examination and treatment work. In addition, they make white things look white and clean. The Cool-light incandescent is best here, too, in portable lamps and "goosenecks."

Conclusion—There are many types of lamps and lighting equipment available today. A little extra time invested by the doctor to determine the proper selection and use of each type for his office can pay big dividends in his own "eye comfort" and efficiency, as well as in creating an environment conducive to a growing practice.

D. P. CAVERLY

Lighting Engineer

THE IMPLICATIONS OF THE RHEUMATIC FEVER SURVEY

Prompted by a growing feeling among physicians and public alike that rheumatic fever is declining in frequency and consequently of decreasing importance has a public health problem,

a survey designed to evaluate the frequency of this disease in Minnesota was conducted under the auspices of the Minnesota State Medical Association, Minnesota Heart Association and Minnesota Department of Health. The results of this survey, essentially the response to a questionnaire sent out to all physicians in the state, was reported in MINNESOTA MEDICINE in April, 1956.¹

Surprising to most were the results obtained. On face value they appeared to indicate that rheumatic fever continues to be a problem of considerable magnitude in our state. For example, the 50.8 per cent of state physicians responding to the survey reported having diagnosed and treated 2,297 cases of rheumatic fever in 1955. Extrapolation permitted the survey committee to conclude that Minnesota physicians had probably diagnosed and treated more than 4,000 cases of rheumatic fever during the single year (1955) covered by the survey.

Because of the large number of cases of rheumatic fever reported in the survey in contrast to the small number formally reported to the State Department of Health, two questions of prime importance were raised by the Rheumatic Fever Survey Committee. These were "how many actual cases of rheumatic fever were represented among the 2,297 cases reported by the physicians and "how many the cases reported met the criteria of Jones^{2,3} for diagnosis of this disease." To answer these questions a careful re-evaluation of the reports of a sample group of physicians submitted in the original survey was carried out. As a result of this study⁴ it was found that there was, at most, 20 per cent "over-reporting," and that 90 per cent of the "actual" cases reported met completely the modified criteria of Jones³ for the diagnosis of rheumatic fever.

Conclusions from these two studies now seem inescapable. During the year covered by the survey at least 3,000 acceptably diagnosed cases of rheumatic fever were treated by physicians in the State of Minnesota. Two-thirds occurred in children and no area of the state was exempt. Certainly, rheumatic fever continues to be a clinical and public health problem of real magnitude in our state.

Another aspect brought into focus by the survey deserves special comment. Although appreciable numbers of rheumatic patients were diagnosed and treated by specialists, the great majority were discovered and treated in their home

community by general practitioners—the family physicians. Perhaps with increasing awareness of diagnostic criteria and improved methods of treatment and prophylaxis the site of diagnosis and management of rheumatic patients has shifted from the large medical center and clinic back to the family physician. Such a shift would account, at least in part, for the conviction in many quarters that this disease is disappearing and no longer of practical importance.

Newer methods of prevention of rheumatic fever make imperative a full awareness of the prevailing medical problem represented by this disease and in this wise the survey fills a gap in our medical knowledge.

Although treatment of rheumatic fever remains empirical and to some extent inadequate, every physician has at his disposal extraordinarily effective means for prevention of initial attacks and prophylaxis of recurrences and infectious complications of this disease. In a recently revised statement,⁵ the American Heart Association has presented recommendations of methods for prevention of initial attacks of rheumatic fever by treatment of infections due to the Group A streptococcus, prevention of recurrences by continuous prophylaxis against streptococcal infection and effective prophylaxis against complicating subacute bacterial endocarditis.

Viewed in the light of studies by Rammelkamp et al^{6,7} the results of the rheumatic fever survey suggests that at least 100,000 streptococcal throat infections occurred in Minnesota during 1955 which either were not treated at all or were treated with antibiotics or dosages of antibiotics insufficient to eliminate the Group A streptococcus from the tissues.*

Not every streptococcal infection will be presented to a physician for treatment and, consequently, we cannot expect to eliminate rheumatic fever completely by application of available knowledge concerning its streptococcal etiology. However, much progress will be made in decreasing the incidence of this life-threatening disease, if every physician concentrates his attention on *specific* diagnosis and *complete* treatment of recognized streptococcal infection and utilizes fully available knowledge concerning specific prophylaxis

*Treatment of streptococcal sore throat or scarlet fever with the sulfa drugs will not prevent their non-suppurative sequelae, rheumatic fever and acute nephritis, since sulfa therapy does not eliminate the streptococci from the tissues of the host.

against the occurrence of streptococcal infection in known rheumatic subjects.

The observations of the survey indicating that rheumatic fever is still a common disease might also be interpreted as strong support for a continued program of research directed toward gaining more complete understanding of pathogenic mechanisms involved in this disease and toward developing better methods for its specific diagnosis and treatment.

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ROBERT A. GOOD, Ph.D., M.D.
*American Legion Memorial
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CHANGING CONCEPTS IN THE TREATMENT OF TUBERCULOSIS

Organization of the Vocational Training Units at Papworth and Enham-Alamein

As the main object of vocational training is job placement, this is kept in view from the date of application for admission. The physician who recommends admission is advised to have his patient seen by his local Disablement Resettlement Officer. This official will know the possibilities of placement in a trade within the scope of our workshops, where we have leatherwork in travel goods, carpentry up to high-class furniture making, carbody building with its associated electrical fitting, metalworking and welding, upholstery, light engineering with tool-making, and printing and book-binding. There are also some vacancies in the

This is the tenth in a series of editorials on pulmonary diseases.

secretarial, draughtsmanship and accountancy sections. After full clinical examination, the patient is seen by the social worker, who will learn the background and economy of his work and his home conditions. Within three to four weeks he can be referred to the training officer and the works manager, and shown round the shops.

Immediately he starts work at three hours per day he draws generous money grants regulated according to his marital state and home commitments. He then progresses by trial and error; we do not attempt to rush the process. First, he attends a preliminary training school for three months to learn by theory and practice the tools and materials of his chosen trade. It would be useless to confine his work to machines for mass production, for it is possible he may have to earn his living in a small business, perhaps on his own.

At the end of the three months a complete review is carried out by a personnel panel, which consists of the medical director, (chairman), the rehabilitation medical officer, the director of industries, the works manager, the social worker and the head nurse. Each reports his own observations, so that a decision can be made on further hours of work in the main shops, and, if necessary, on a change in training if this had not already been decided at the patient's own request. Similar reviews are carried on at three-monthly intervals. Hours of work may be extended or reduced.

If any man is found unsuitable because he is not taking proper advantage of his opportunities, or is not conforming with the disciplines of treatment, he is reported by the personnel panel to a case conference at which representatives of the Ministry of Labour are present. This body has the power to terminate training, but on the other hand it can continue training beyond the statutory limits where medical opinion recommends this course. This latter decision is often recommended for patient-workers who need further active therapy, and are generally in the category likely to go on to settlement in the hostels or in the village housing estates.

The case conference also reviews the reports of the individual works managers and the training officer, and sees to it that training is progressive on bench work. It is therefore in a position to sum up the competence of the trainee for the work arranged for him in his own area by his local resettlement officer, who gets three

months' notice of impending discharge. Every man who completes training can therefore get a certificate, which entitles him on return home to the benefits granted by arrangements made between the trade unions, the Ministry of Labour and the industrial management of the settlements.

On the whole the organization works smoothly. Self-discharges do occur, but in the majority of cases they are due to domestic difficulties. We do not deny that there are difficulties; we do our best to meet them and overcome them, keeping in mind the ever-new aphorism of medical teaching: "remember it is the patient who is ill."

RICHARD R. TRAIL, M.D.
London, England

A new disease of the nervous system, described by pediatricians connected with the New York University-Bellevue Medical Center, was reported to the Practitioner's Society by Dr. L. Emmett Holt, Jr., professor and chairman of the department of pediatrics in that institution.

The disease develops in young infants who appear normal at birth but who deteriorate mentally in the course of a few weeks or months and terminate fatally. The disease runs in certain families. A most characteristic feature of the disease is a strong odor resembling that of maple sugar found in the urine. Although the disease has been called "maple sugar urine" disease, the abnormal substance in the urine is not maple sugar.

The first case was described in Boston about a year ago by Dr. John Menkes, now a member of the pediatric staff of Bellevue Hospital. Recently, a former member of the Bellevue pediatric staff, Dr. Sheldon Miller, now a resident pediatrician at the Meadowbrook Hospital, identified such a case. Studies of this patient's blood and urine carried out in the laboratories of the department of pediatrics by Dr. Roland G. Westall and Dr. Joseph Dancis have gone far to explain the nature of the disease and have indicated the possibility that it may be controlled by diet. This disease is due to an abnormality of the metabolism of three important amino acids—leucine, isoleucine and valine. These amino acids which are among the human dietary essentials, are not handled normally; they accumulate in the blood and affect the composition of the urine. Although the nature of the metabolic disturbance was not identified in time to save the present patient, it is now felt that other patients so affected could be saved by adjusting the amino acid composition of the diet.

World peace cannot be attained until we build peace into the hearts and minds of men. Since physicians are the most intimately acquainted with the physical and mental needs of their patients, they are the most logical engineers for this great moral construction project. If we, more than a half million physicians, assume this task on an individual, personal basis, we may yet succeed where soldiers, statesmen and politicians have previously failed.—GUNNAR GUNDERSEN, M.D., *World Med. J.*, May, 1956.

President's Letter

THE ROLE OF THE BLUE SHIELD IN MEDICINE

Scientific medicine has made advances in the health care of the people far beyond the most ambitious notions of physicians fifty years ago. Members of the medical profession have not only realized great scientific attainments but have made a tremendous contribution to progress in the economic phase of medicine in recent years.

Even though the history of the Blue Shield commences as recently as 1939, with the inception of plans for prepaid medical care through this medium in California, Michigan and New York, the medical profession has successfully developed a method of meeting the costs of medical care in such a way that the prospect of governmentally controlled medicine has receded.

The origin, growth and economic relationship of Blue Shield to the profession are of vital importance to every physician. During the 1930's, the trend toward compulsory governmental health insurance was increasing. It seemed, then, that some positive action by the medical profession was imperative. Since then, the Blue Shield program of voluntary, nonprofit prepaid medical care has become so widely favored and successful that plans of this nature are now found in all but five states, and more than 37,000,000 people have Blue Shield medical-care coverage.

Moreover, the progress that has been made in expanding the coverage provided by Blue Shield has been remarkable. Some Blue Shield plans are now including benefits for in-hospital medical care, anesthesia service, diagnostic laboratory and other services of physicians. Twenty Blue Shield plans now offer contracts to include catastrophic illness or extended benefits applying to such illness.

As striking as these prepaid medical-service plans have been all over the country, no less striking has been the progress made by the Minnesota Blue Shield plan. This plan was organized no longer ago than November of 1947, but it now has an enrollment of more than 800,000, or one of every four persons in Minnesota. It ranks among the first twelve Blue Shield plans of the country in enrollment. Its benefits have been increased repeatedly, and the scope of coverage has been expanded under two contracts which provide benefits for those of low or modest incomes.

At present, the governing body of the Minnesota Blue Shield is a board of directors which consists of eleven members, *all* of whom are physicians. By-laws require that the corporate members elect a board of directors composed of eleven physicians, and that the board of directors consist of one doctor of medicine from each of the nine councilor districts and two from the state at large. The two from the state at large have always been from Minneapolis and St. Paul.

An increase in the size of the corporate body which elects this board of directors has been advocated by some physicians and is under consideration at the present time by the board of directors.

The thought behind the proposal is concerned mainly with a broadening of the base on which the board is elected, so that physicians generally will have a greater interest in and control of the activities of Blue Shield.

The proposal was made originally in a resolution introduced by the St. Louis County Medical Society and it was adopted as the policy of the House of Delegates of the Association at its annual meeting in May, 1956. Whether this proposal, if adopted by Blue Shield in accordance with the action taken by the House of Delegates, would in fact result in any change in the board of directors is conjectural.

The thought has been expressed that broadening of the base would tend to make the members of the medical profession feel more closely associated with the board of directors of the Blue Shield. It seems to me that any procedure which might accomplish this endeavor would be worthy of consideration by everyone.

PRESIDENT'S LETTER

Members of the present board of directors are Dr. R. R. Cranmer, of Minneapolis, president; Dr. O. I. Solberg, of St. Paul, vice president; Dr. C. A. McKinlay, of Minneapolis, secretary; Dr. E. Covell Bayley, of Lake City, treasurer; Dr. C. M. Bagley, of Duluth; Dr. E. M. Hammes, of St. Paul; Dr. P. G. Hoeper, of Mankato; Dr. C. W. Moberg, of Detroit Lakes; Dr. Edwin J. Simons, of Edina; Dr. L. L. Sogge, of Windom; and Dr. W. W. Yaeger, of Marshall.

Dr. Edwin J. Simons, as you all know, is the executive and medical director, and no more devoted and dedicated physician to the cause of the Blue Shield will ever be found.

Mr. F. Manley Brist, of St. Paul, is the legal counsel of Blue Shield, and he has done a superb job in giving legal advice to the board of directors as that body developed Blue Shield to its present highly respected stature.

Members of the board of directors have given unstintingly of their time, knowledge and experience to the service of Blue Shield. Meetings of the board of directors or its executive committee are held at least monthly, and at times more often. It is obvious that much time is required to become acquainted with the many phases of Blue Shield, the contract benefits, the enrollment procedures, fair and reasonable rates for subscribers, the absolute necessity for operation without deficit, the meeting of reserve levels that are recommended by actuaries, and all the other major responsibilities of the physicians who serve on the board of directors. To have these manifold things well done from a policy-making level requires a board of directors with devotion to the cause, sincerity of purpose, willingness to expend much time, and no small degree of experience and judgment. All these are given by members of the board without compensation or request for remuneration.

Because of the efforts of this devoted board, remarkable progress has been made in the development of Blue Shield. Probably no one realizes more fully than this board that there are still many ways in which the coverage of Blue Shield contracts can be improved.

I have known physicians from many places, in this country and abroad. They are a group of human beings who are dedicated to their work. I am sure that no matter who the elected board of directors may be, those who succeed earlier members will continue to show this devotion to the cause, even though it may require much time and experience for them to become as valuable as those who have now served so long and so faithfully.

The Honorable Marion B. Folsom, Secretary of Health, Education, and Welfare, has suggested several ways of "expanding and improving voluntary health insurance to help meet the everchanging needs and desires of the people." This includes coverage to meet catastrophic illness, coverage of older persons, and better coverage of persons who are not members of organized groups and those with low incomes. In trying to stem the tide of some form of governmentally controlled care and in pioneering efforts toward the goals outlined, Blue Shield has demonstrated the ability and willingness of the medical profession to maintain equitably and reasonably the economy of medical practice.

With a united profession, loyal to its own economic progeny, which is Blue Shield, there can be little question that the medical profession will continue to maintain an adequate, effective and proper voice in the economy of medical practice.

A large, elegant handwritten signature in dark ink, reading "J. M. Bergen". The signature is written in a cursive style with a large, sweeping loop at the beginning and end.

President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

CAPITOL ACTION SLOW ON HEALTH BILLS

In mid-February there were still no signs of early action on any of the major health bills introduced in Congress to date. The two principal committees on health legislation (Senate Labor and House Commerce) were still unorganized. The House Appropriations sub-committee on health has been organized, however, and is a five-man group instead of a seven. Its chairman again is Representative Fogarty (D., R. I.). Others are Representatives Lanham (D., Ga.), Denton (D., Ind.), Taber (R., N. Y.), and Laird (R., Wis.), the only new member of the group.

New Health Bills Introduced

Bills continue to be introduced. Medical and other problems of the aged continue to carry a priority of interest as do bills on drugs and drug control.

In the military field, a bill has been introduced to assist in the procurement of physicians and other technically and scientifically trained personnel for the military services. Under the provisions of this bill, scholarships would be authorized to cover living expenses, tuition, library and laboratory fees, books and materials.

Bills designed to broaden veterans' benefits also continue to occupy the attention of many members of Congress.

The most important bill thus far concerning federal employe health insurance has been introduced by Representative Lesinski (D., Mich.). It is sponsored by a federal employes' union and provides that the U. S. would pay 50 per cent of the cost of basic or catastrophic health insurance for civilian employes and their spouses and children under 19 years; there would be payroll deductions for the employe's share of premiums. An administration bill is expected to be introduced later.

National Health Insurance Again Proposed

One of the original sponsors of the 14-year-old national health insurance proposal and the son of another co-sponsor have introduced identical

bills on the subject in the House and Senate. The measures are S.844 by Senator Murray (D., Mont.) and H.R. 3764 by Representative Dingell (D., Mich.). Dingell, long-time champion of national health insurance, has won a seat on the committee to which most health legislation will be referred—Interstate and Foreign Commerce.

The bills introduced differ from the original Murray-Wagner-Dingell bill only in their scope. Because some sections have since been enacted into law piecemeal, the 1957 version is minus these features: education of health personnel, medical research, Hill-Burton expansion, aid to rural and shortage areas, more state grants for health work, and grants for maternal and child health.

The bill does provide a contributory system of health insurance covering the working population, similar to social security. A separate bill to be introduced later would charge workers 1½ per cent of earnings or up to \$90 a year, with employers contributing an equal amount. The money would go into the U. S. Treasury under a Personal Health Services Account separate from social security but with the Social Security Administration running the program. Covered workers and their families would be eligible for preventive and diagnostic exams, lab and x-ray services, hospitalization up to 60 days, dental services, more expensive drugs, special appliances and eye-glasses.

BILLS INTRODUCED ON TAX DEFERMENT FOR SELF-EMPLOYED

Representative Jenkins (R., Ohio) and Representative Keogh (D., N. Y.) introduced their bills to encourage the establishment of voluntary pension plans by self-employed individuals in January. These proposals are somewhat similar to the Jenkins-Keogh bills of the last Congress but with lower dollar limits. Unlike the earlier Jenkins-Keogh bills, they extend tax deferment to self-employed persons only. They would permit a self-employed individual taxpayer to deduct from adjusted gross income a limited amount equal to payments made by him each year to obtain retirement income for himself or payments to his beneficiaries or his estate.

WAR SERVICE BRINGS SOME M.D.'s INTO SOCIAL SECURITY

Physicians who served in World War II are covered by social security. Any person who served in the uniformed services from Sept. 16, 1940, until the last day of this year would be treated as though he had earned \$160 per month in wages and as though he had been making contributions to the Social Security Trust Fund.

HOW TO WRITE MINNESOTA CONGRESSMEN

Physicians wishing to contact the Minnesota Congressional delegations should make note of their proper addresses and the names of the members' chief assistants:

Senate

1. Senator Edward J. Thye: 458 Senate Office Building; Home, Sheraton-Park Hotel, Washington. Administrative assistant, Robert Forsythe.
2. Senator Hubert H. Humphrey: Office, 140 Senate Office Building; Home, 3216 Coquelin Terrace, Rock Creek Knoll, Chevy Chase, Md. Administrative assistant, Herbert Waters.

House

First District: Representative August Andresen; Office, 1533 House Office Building; Home, Mayflower Hotel, Washington. Secretary, Reynold Bergquist.

Second District: Representative Joseph O'Hara; Office, 1534 House Office Building; Home, 2813 31st St. N.W., Washington. Secretary, Josephine Peters.

Third District: Representative Roy Wier; Office, 424 House Office Bldg.; Home, Congressional Hotel, Washington. Secretary, Charles Munn.

Fourth District: Representative Eugene McCarthy; Office, 102 House Office Building; Home, 2016 Courtland Place, Washington. Secretary, Clinton R. Boo, Jr.

Fifth District: Representative Walter Judd; Office, 1225 House Office Building; Home, 3083 Ordway St., Washington. Secretary, Verne Johnson.

Sixth District: Representative Fred Marshall; 1207 House Office Building; Home, 904 Chalfonte Drive, Alexandria, Va. Secretaries, Paul Pressler and Gerald Ellert.

Seventh District: Representative H. Carl Andersen; Office, 1314 House Office Building;

Home, 4000 Massachusetts Ave., Washington. Secretary, Susanna Johnson.

Eighth District: Representative John A. Blatnik; Office, House Office Building; Home, 1808 N. Quinn St., Arlington, Va. Secretary, L. J. Andolsek.

Ninth District: Representative Coya Knutson; Office, House Office Bldg.; Home, Continental Hotel, Washington. Secretary, Bill Kjeldahl.

RULES ON OSTEOPATH COMMISSIONING OUTLINED

The defense department has issued a directive outlining policy in the commissioning of osteopaths in the military services, a law passed by the 84th Congress. An osteopath must meet the following requirements, among others:

1. Be a graduate of a college of osteopathy whose graduates are eligible for licensure to practice medicine or surgery in a majority of the states, and be licensed to practice medicine, surgery or osteopathy in one of the states, territories or the District of Columbia.

2. Possess such qualifications as the Secretary concerned may prescribe for his service after considering the recommendations for such appointment by the surgeon general of the Army, Air Force or Navy.

3. Have completed a minimum of three years college work prior to the entrance into a college of osteopathy, plus a four-year course with degree of doctor of osteopathy in a school approved by the American Osteopathic Association, and a year internship or residency training approved by the AOA.

MEDICARE PROGRAM RUNNING SMOOTHLY

In the first eight weeks of the Medicare program, medical treatment and hospital bills totaling nearly \$84,000 were approved for payment by the central office in Washington. Broken down, it came to 623 hospital claims for \$50,083 and 437 medical and surgical care cases for \$33,682.60. Since physicians' billings in this time period were from 11 states and Hawaii and the hospital care obligations were only those handled by Blue Cross, since invoices were not yet submitted by Mutual of Omaha to cover payments made in states where that insurance firm is fiscal agent (as is the case in Minnesota), it is apparent that military

dependents are utilizing these newly-authorized civilian services in large measure. Taking one state's claims at random (Mississippi), Medicare officials were elated to find that 20 per cent of its claims fell below fee schedule maximums. There were eight procedures (out of a total of thirty-nine) in this category: four in obstetrics, two tonsillectomies and two medical cases.

PRESIDENT'S BUDGET REQUEST FOR HEW TOPS \$3 BILLION

More than \$3 billion has been requested by President Eisenhower for Department of Health, Education and Welfare activities in fiscal 1958. The budget includes \$477,545,000 to cover the first year cost of new legislation, mainly dealing with school construction, recommended by the President.

For fiscal 1957 the President had requested \$130 million in Hill-Burton funds (Congress appropriated \$125 million). For fiscal 1958, President Eisenhower has asked Congress for \$121.2 million in Hill-Burton appropriation.

The Public Health Service has requested the following appropriations for fiscal 1958:

Chronic disease and health of the aged, \$2.7 million; Construction grants for medical facilities (both research and training facilities), \$45 million; grants for health services training, \$15 million; nurse training, \$3 million; national health survey, \$1.3 million; Indian health activities, \$50 million, medical research, \$190.2 million. \$1,450,000 has been requested for the operation of the National Library of Medicine.

The budget sought for the Food and Drug Administration was set at \$10,554,500. The Social Security Administration budget request was for \$1,733,165,000.

Attacks against medical items in the Federal budget indicates a bi-partisan campaign in the Senate for ever higher health appropriations. Senator Margaret Chase Smith (R., Maine) and Senator Lister Hill (D., Ala.) charged the Administration with 1, withholding \$10 million in medical research grants which Congress expected the Public Health Service to allocate this year; 2, employing bookkeeping legerdemain to make it appear that an additional \$7 million will be provided for research aid in 1957-58 when project funds actually will be less because more money will have to be drained off for higher overhead payments; 3, proposing a "quite disappointing"

\$2.7 million in project grants for the aging and chronically ill after having led the nation to believe a more adequate program would be recommended by the White House this year. The statement of the two Senators also deprecated budgetary provision of only \$3 million to inaugurate a new program of construction aid to medical and dental schools. With aggregate needs running into hundreds of millions, that sum "is hardly a drop in the bucket," the Senators asserted.

BRITISH PHYSICIANS QUOTED

Salary Squeeze

British doctors, under the socialized medicine program, have not had a pay raise since 1951. During this period the costs of living in England has increased about 24 per cent. The doctors say their present average pay of \$6,160 is not enough to meet rising living but a ministry of health spokesman is quoted as saying a 24 per cent boost in fees "could not be afforded under the present conditions."

British Journal Editorialized on GP

A recent issue of the *British Medical Journal* says that "The difficulties which beset the general practitioner are in many respects different from those which await the consultant. In the case of the former there is lack of time, the wide field of knowledge to be embraced, and a year-long familiarity with the patient. There are but few occasions on which a general practitioner can devote 20 minutes or more to history-taking, yet most mistakes in diagnosis are due to inadequate anamnesis. In the last few years this obstacle has been increased to an alarming extent by the paramedical duties inflicted on him by the Health Service. To the consultant this difficulty does not exist in private practice. The general practitioner has, furthermore, to exercise reasonable knowledge and skill in medicine, surgery and obstetrics. In thus doing, his overall efficiency is greater than that of the consultant or specialist. It is to be hoped that Her Majesty's judges will not fail to make clear to juries in the litigation which threatens to deter our young men from acceptance of responsibility."

FDA CIRCULARIZES ON HOXSEY CURE

The Food and Drug Administration is mailing out to all postoffices and substations in the U. S., a poster warning the public on the Hoxsey "cancer

ure" FDA officials said they took this unusual step because final court action against the Hoxsey group will not be completed for some time.

HEALTH STATISTICS REVEALED

Mental Hospital Population Decreases

Minnesota's mental hospital population continues to decrease as it has since February, 1956, except for a slight increase in August. During the past year there was a net increase in population in all types of state institutions except for the mentally ill, inebriates and patients at Gillette hospital.

State Ranks High in Health Facilities

A national report on hospital facilities shows that Minnesota is well above the national average in available facilities. Only six states west of the Atlantic seaboard have more general hospital beds per 1,000 of population than Minnesota.

Population Soars in Ten Years

Since 1946 this country has had an explosion of growth. In 1946 the population was 141,389,000; in 1956, 168,091,000—up 19 per cent. There were more babies born (up 23 per cent); fewer dying at birth (down 23 per cent); fewer mothers dying in childbirth (down 75 per cent) and a lower death rate (15 per cent).

In Minnesota last year the number of live births hit a new high of 81,800. Death rates rose one tenth to 9.2. Maternal deaths dropped for a new low of 0.2 per 1,000. Top killer in the state was heart disease, up four per cent to 37.7 per cent of total deaths; cancer was second, constant at 17 per cent while diseases of the liver and gall bladder rose from tenth to ninth place.

ENDOMETRIAL HYPERPLASIA

(Continued from Page 157)

cases of endometrial carcinoma following known hyperplasia will continue.

Summary

1. One hundred and sixty-two patients with proven endometrial hyperplasia who were treated between 1939 and 1949 have been used to study

the problem of the relation between this disease and adenocarcinoma of the endometrium.

2. Treatment consisted of conservative therapy (curettage, progesterone, et cetera in ninety-five, x-ray sterilization in fifty and hysterectomy in seventeen. Of the 162 patients, 139 could be traced. Of these, a further seventeen had been treated by hysterectomy elsewhere.

3. In the thirty-four with surgical specimens and the remainder of those followed, no adenocarcinoma of the endometrium has been found.

4. No evidence has been uncovered to suggest that endometrial hyperplasia or its conservative treatment, as applied here, is cancerigenic. The choice of treatment of endometrial hyperplasia should be determined on other grounds than the fear of the precancerous significance of endometrial hyperplasia.

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Minnesota State Medical Association

Revision of Articles of Incorporation, Constitution and By-laws

At the bottom of this page you will find a notice stating that at the next annual meeting of the Minnesota State Medical Association the present Articles of Incorporation, Constitution and By-laws of the Association will be considered for amendment, together with proposed revisions of same as recommended by the Council after exhaustive study and deliberation.

Several developments have necessitated revision of the Articles of Incorporation. First, changes were necessary to meet the requirements set out in the Minnesota Nonprofit Corporation Act, Chapter 550, Laws of Minnesota 1951, relating to organizations such as ours. Our Articles of Incorporation were adopted in the year 1869 and amended in 1937. Secondly, amendments were needed to protect our tax-exempt status with regard to personal property taxes levied by Ramsey County.

This action, of course, affected the Constitution and By-laws under which the Association was operating, and this seemed to be an appropriate time to thoroughly review and revise these instruments in detail. Also, many component county medical societies have indicated a desire and need for revision of their constitution and by-laws. Accordingly, a special committee of the Council and the Council, with the assistance of Mr. Jule Hannaford, legal counsel, developed the proposed new

By-laws for the consideration of the House of Delegates at the meeting in Saint Paul, May 12 and 13. Under the new code, a constitution is no longer required.

We have endeavored to eliminate inconsistencies between our By-laws and those of the American Medical Association, and otherwise modernize and improve our organizational structure.

We would appreciate each member reviewing this material carefully and forwarding constructive criticism or suggestions for the consideration of the Council and the House of Delegates. These suggestions may be sent to the state office, 496 Lowry Medical Arts Building, Saint Paul.

When amendment and adoption of these By-laws is completed, we will undertake to make available some suggestions or models for revision of the constitution and by-laws of component medical societies. Several societies have also indicated that the charter issued to the society has been lost. It may be desirable to consider re-issuance of these charters.

Please give these matters your close personal attention, and we shall appreciate receiving your suggestions.

J. A. BARGEN, M.D., *President*

C. L. OPPEGAARD, M.D., *Chairman
of the Council*

NOTICE OF ANNUAL MEETING

NOTICE IS HEREBY Given that at the annual meeting of the House of Delegates to be held at Saint Paul, Minnesota, on May 12 and 13, 1957, there will be brought up for discussion and adoption the following resolutions:

1. A resolution repealing in their entirety the present Articles of Incorporation, Constitution and By-laws of the Minnesota State Medical Association.
2. A resolution adopting in lieu thereof new Articles of Incorporation and new By-laws in the form attached hereto as Exhibits 1 and 2, respectively.

NOTICE IS FURTHER GIVEN That the Council of the Minnesota State Medical Association at its meeting held in Saint Paul, Minnesota, on February 10, 1957, proposed adoption of such new Articles of Incorporation and new By-laws and directed that the same be submitted to the House of Delegates for adoption.

Dated February 10, 1957

B. B. SOUSTER, M.D.
Secretary

**ARTICLES OF AMENDMENT
TO
ARTICLES OF INCORPORATION
OF
MINNESOTA STATE MEDICAL ASSOCIATION**

BE IT RESOLVED That the Articles of Incorporation of this corporation be and the same hereby are amended in their entirety to read as follows:

ARTICLE I

The name of this corporation shall be Minnesota State Medical Association.

ARTICLE II

The purposes of this corporation shall be community welfare, community health and scientific education, and shall be limited to bringing into one compact organization the entire medical profession of the State of Minnesota and uniting with similar societies of other states to form the American Medical Association; promoting the science and art of medicine; elevating the standard of medical education so that the profession shall become more capable and honorable within itself and more useful to the public in the prevention and cure of disease and adding to the comforts of life; fostering, to that end, the presentation of papers, articles, findings and studies by its component county and district medical societies in the field of medical research, diagnosis, therapy, operative procedure, prevention of disease and promotion of the public health; assisting officials and agencies of the State of Minnesota with advice and service in the administration of its medical, hospital, welfare and public health programs; promoting through its component county and district societies, continuous advice and assistance in county welfare and public health programs; and promoting high standards of medical and health service in all public programs established for the welfare of the people of Minnesota.

ARTICLE III

The corporation does not and shall not afford pecuniary gain, incidentally or otherwise, to its members or to any component county or district medical society and shall not be operated for the purpose of making

any profit. No part of the earnings of the corporation shall enure to the benefit of any member or any component county or district medical society. All income of the corporation shall be used for the fulfillment of the purposes for which it was formed, including operating expenses of the corporation. In the event of a dissolution of the corporation, any and all assets of the corporation shall be distributed or conveyed only to a like corporation or institution or to an academy, college, seminary of learning, university, public hospital, institution of purely public charity or to the State of Minnesota.

ARTICLE IV

The corporation shall have authority to perform all acts necessary and proper to accomplish its purposes as set out above and not repugnant to law and shall have the authority specifically provided by Chapter 317 of Minnesota Statutes 1955 and any acts amendatory thereto.

ARTICLE V

The period of duration of this corporation's existence shall be perpetual.

ARTICLE VI

The location of the registered office of this corporation within the State of Minnesota shall be 496 Lowry Medical Arts Building, Saint Paul, Minnesota.

ARTICLE VII

The members of this corporation shall have no personal liability for the obligations of the corporation.

ARTICLE VIII

This corporation has no capital stock.

ARTICLE IX

The Board of Directors of this corporation shall have authority to amend the Articles of Incorporation of this corporation.

**BY-LAWS OF
MINNESOTA STATE MEDICAL ASSOCIATION**

ARTICLE I

TYPES OF MEMBERSHIP

1.1 Membership in the Association shall be limited to individuals. Membership shall be of three types: active, honorary and affiliate, any one of which may be broken down into different classes.

1.2 Each person by becoming a member of the Association agrees to comply with and be bound by all the provisions of the Articles of Incorporation and By-laws of the Association, as now or hereafter amended, the Constitution and By-laws of the American Medical Association, as now or hereafter amended, and the

Principles of Medical Ethics of the American Medical Association, as now or hereafter amended.

ARTICLE II

COMPONENT SOCIETIES

2.1 The members of the Association shall be organized into county and district medical societies, each of which shall be known as a component society, chartered by the Association, as hereinafter provided. Not more than one component society shall be chartered to operate in any county except in a county so large in area as to make it impractical for one society to operate. A component society may be chartered to

operate as a district society in two or more counties which are sparsely settled. The territorial jurisdiction of each component society shall be set forth in the charter issued to it by the Association.

2.2 Any component society which has adopted principles of organization employing the substance of Articles II and III of the Articles of Incorporation of this Association and not otherwise in conflict with the Articles of Incorporation and By-laws of the Association may, upon approval of its application therefor by the House of Delegates, become a component society and receive a charter evidencing the fact that it is a component society. Each charter so issued shall be signed by the President and the Secretary of the Association.

2.3 Nothing contained in any charter so issued or in the Articles of Incorporation or By-laws of the Association and no action of the House of Delegates or of the Council shall bind or commit any component society to carry out any policy or recommendation of the Association not contained in the Articles of Incorporation or By-laws.

2.4 Any charter issued to a component society may be revoked by the House of Delegates if such component society acts in violation of the Articles of Incorporation or By-laws of the Association.

2.5 A person desiring to become a member of a component society must join the component society having jurisdiction over the area where he resides; provided, however, that where a person maintains his principal office in one county and his residence in another he may join either the component society having jurisdiction over the area where he maintains his principal office or the component society having jurisdiction over the area where he resides; and provided, further, that a person residing on or near a county line may join the component society most convenient for him if he first obtains the consent of the component society having jurisdiction over the area where he resides.

2.6 Each component society shall have general direction of the affairs of the profession in its county or district, and its influence shall be constantly exerted for bettering the scientific, moral, and educational condition of the county or district, and systematic efforts shall be made by each member, and by the society as a whole, to increase the membership until it embraces every qualified physician in the county or district.

2.7 Each component society shall judge the qualifications of its own members, but, as such societies are the only portals to this Association and to the American Medical Association, ample opportunity to become a member shall be given to every physician in the county or district who is eligible according to the provisions of this Constitution and By-laws.

2.8 The Secretary of each component society shall keep a roster of its members and of the non-affiliated registered physicians of the county or district, in which shall be shown the full name, address, college and date

of graduation, date of license to practice in this state and such other information as may be deemed necessary. In keeping such roster the Secretary shall note any change in the personnel of the profession by death or by removal to or from the county or district, and in making his annual report he shall be certain to account for every physician who has lived in the county or district during the year.

2.9 The Secretary of each component society shall forward the dues of its members, together with its roster of officers and members, list of delegates and list of non-affiliated physicians of the county or district, to the Secretary of the Association on or before April first of the year for which they are levied and shall forward the assessments of its members within the time specified therefor.

2.10 Each component society which fails to forward to the Secretary of the Association the dues of its members and said roster on or before April first of the year for which they are levied, shall be held as suspended and none of its members or delegates shall be permitted to participate in any of the business or proceedings of the Association or of the House of Delegates until such requirements have been met.

ARTICLE III

ACTIVE MEMBERS

3.1 A person shall be eligible to become an active member only (a) if he holds the degree of Doctor of Medicine or Bachelor of Medicine issued by an institution of learning accredited by the American Medical Association at the time of conferring such degree, (b) if he is (i) licensed to practice medicine in the State of Minnesota or (ii) licensed to practice medicine in another of the states or the District of Columbia or (iii) not engaged in the active practice of medicine, not licensed so to do, but engaged within the State of Minnesota in an activity allied to medicine which does not require licensure from the State of Minnesota, and (c) if he is a member of a component society.

3.2 Each member of a component society of the Association shall become an active member of the Association upon election thereto by his component society and upon receipt by the Secretary of the Association of the full dues and assessments payable during the then current fiscal year of the Association if such election occurs prior to July 1, or one-half thereof if such election occurs on or after July 1, for the class of active membership to which he was elected.

3.3 Active members shall be divided into the following classes:

A. *Active Member, Regular.* Regular active members shall be those who pay the full dues and assessments of the Association.

B. *Active Member, Life.* A person who shall have been a regular active member of this Association or of another constituent association of the American Medical Association and this Association for forty years and

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shall have reached the age of 70 years shall be eligible to become a life active member upon election thereto by the Council.

C. *Active Member, Service.* A regular active member of the Association who is called to temporary duty in the armed forces of the United States shall be eligible to become a service active member on the January 1 or July 1 which next follows the date of his entrance into military service, upon election thereto by the Council and to retain such class of active membership until the January 1 or July 1 which next follows his discharge from the armed forces of the United States.

D. *Active Member, Associate.* A regular active member of the Association who because of disability is unable to engage in the active practice of medicine or who has retired from the active practice of medicine, shall be eligible to become an associate active member upon election thereto by the Council and to retain such class of active membership so long as he does not engage in the active practice of medicine.

E. *Active Member, Residency.* Any person who shall be engaged in a residency program approved by the Council on Medical Education and Hospitals of the American Medical Association, who shall be a residency member of a component society of this Association, and who applies therefor within five years following his graduation from medical school (provided that time spent in the armed forces of the United States shall be excluded in calculating such five year period) shall be eligible to become a residency active member upon election thereto by the Council and to retain such class of active membership until he ceases to be engaged in graduate study or work.

ARTICLE IV

DUES AND ASSESSMENTS OF ACTIVE MEMBERS

4.1 The annual dues and assessments payable by active members of the Association and, in the case of assessments, the time for payment thereof shall be established for each fiscal year of the Association by the Council but only in accordance with recommendations with respect thereto by the House of Delegates.

4.2 Each active member, unless exempted therefrom, shall pay to his component society for transmittal to the Secretary of the Association the annual dues and assessments so established. No applicant for membership in the Association shall become a member until the dues and assessments payable by him for the then current fiscal year of the Association have been received by the Secretary of the Association.

4.3 The following exemptions from the payment of annual dues and assessments with respect to the following types of active members shall apply:

A. *Life Active Members.* No dues or assessments shall be payable by life active members.

B. *Service Active Members.* Service active members shall be excused from the payment of dues and assessments for the period beginning on the January 1 or July 1 following the date of their entrance into military service and shall resume payment of dues and assess-

ments on the January 1 or July 1 following the date of their release from military service.

C. *Associate Active Members.* No dues or assessments shall be payable by associate active members.

D. *Residency Active Members.* Residency active members shall pay dues of \$5.00 per year but shall be exempted from the payment of all assessments.

4.4 Annual dues shall be paid to the Secretary of the component medical society by January 1 of the fiscal year with respect to which they are payable. Assessments shall be paid to the Secretary of the component medical society on the date prescribed in the notice with respect thereto.

4.5 Regular active members and residency active members shall be entitled to receive, upon payment of their dues and assessments for a fiscal year of the Association, a subscription to Minnesota Medicine for such fiscal year. All other classes of active members shall not be entitled to receive a subscription to Minnesota Medicine but may receive the same upon payment of the regular subscription price therefor.

ARTICLE V

HONORARY MEMBERS AND DUES THEREOF

5.1 Any person who holds the degree of Doctor of Medicine or Bachelor of Medicine and who is distinguished for his service or attainments in the field of medicine, public health, research or other scientific work contributing to medicine shall be eligible to become an honorary member of the Association upon recommendation of the Council and election thereto by the House of Delegates.

5.2 Honorary members shall pay no dues or assessments to the Association and shall not have the right to vote or hold office.

ARTICLE VI

AFFILIATE MEMBERS AND DUES THEREOF

6.1 Any person who is distinguished for his services in any field of science allied to medicine or in the field of public health shall be eligible to become an affiliate member of the Association upon recommendation of the Council and election thereto by the House of Delegates.

6.2 Affiliate members shall pay no dues or assessments to the Association and shall not have the right to vote or hold office.

ARTICLE VII

TERMINATION OF MEMBERSHIP

7.1 Any member of any type or class who is not in default in the payment of dues or assessments and against whom no complaint or charge is pending may at any time file his resignation in writing with the Secretary of the Association and he shall cease to be a member of the Association as of the date such resignation was filed.

7.2 Dues of a member shall become delinquent if not received by the Secretary of the Association by

June 1 of the year for which levied and assessments of a member shall become delinquent if not received by the Secretary of the Association by the date specified therefor, and any member whose dues or assessments become delinquent shall be suspended from membership if he fails to pay the same to the Secretary of the Association within thirty (30) days after notice of his delinquency has been sent by registered mail to his address as the same appears on the records of the Association by the Secretary of the Association. Any member who is suspended from membership in the Association by reason of the provisions of this section may not be reinstated into membership in the Association until all dues and assessments with respect to the year in which he was suspended (but not with respect to any subsequent year) and all dues and assessments for the year in which he applies for reinstatement shall have been paid in full.

7.3 Any member who is licensed to practice medicine in the State of Minnesota and whose license so to do is revoked or any member who is convicted of a felony shall, upon the occurrence thereof, forthwith cease to be a member of the Association.

7.4 Any member who ceases to be a member of a component society, whether for non-payment of dues, for suspension, for expulsion or for any other cause whatsoever, shall cease to be a member of the Association for the period of time for which he was suspended or expelled from such component society.

7.5 Any member who has been found by the Judicial Committee to be guilty of misconduct as a physician or in violation of the Articles of Incorporation or By-laws of the Association, the Constitution or By-laws of the American Medical Association, or the Principles of Medical Ethics of the American Medical Association may, after a hearing before such Judicial Committee, as hereinafter provided, be censored, suspended from membership in the Association for such period of time as the Judicial Committee shall deem appropriate, or expelled from membership in the Association.

ARTICLE VIII

DISCIPLINARY ACTION

8.1 There shall be a Judicial Committee consisting of nine members appointed by the Council, none of whom shall be a Councilor and no two of whom shall be members of component societies in the same Councilor District. The term of each member shall be for a period of three years commencing January 1. The terms of the members shall be so arranged that not more than three shall expire each year. No member of the Judicial Committee shall hear or pass upon any matter in which he or any member of his family is personally involved.

8.2 The Judicial Committee shall have authority to hear the appeal of a member from a decision of his component society disciplining him and to affirm, modify or reverse any such decision; provided notice of appeal is filed with the Secretary of the Association

within 6 months of the decision of such component society. Appeals shall be in writing, shall set forth the grounds of the appeal, and shall be signed by the appellant. Appeals shall be limited in scope to question of law and procedure. The findings of a component society as to the facts in any dispute shall be final and shall not be subject to review on appeal.

8.3 The Judicial Committee shall also have authority to conduct hearings to determine whether or not a member of the Association has been guilty of misconduct as a physician or of violation of the Article of Incorporation or By-laws of the Association, the Constitution or By-laws of the American Medical Association, or the Principles of Medical Ethics of the American Medical Association and, if the Judicial Committee shall find a member guilty thereof, to take appropriate disciplinary action against such member which may include censorship, suspension from membership in the Association for a specified period of time or expulsion from membership in the Association. No such hearing shall be held unless the accused member shall have been furnished with a written statement of the charges against him and shall have been afforded adequate opportunity to prepare a defense. The Judicial Committee shall have authority to compel any member of the Association to appear at any such hearing and give testimony. At any such hearing the accused member shall be given the opportunity to appear and give such testimony as he may desire, and to be present himself or by counsel while any other person gives testimony and to cross-examine such person. The Judicial Committee shall make its decision promptly after the hearing and shall notify the accused member of its decision in writing.

8.4 Before hearing any appeal from a component society or before commencing any disciplinary action, the Judicial Committee shall make every effort to conciliate and settle the dispute.

8.5 Any decision of the Judicial Committee affirming a decision of a component society which disciplines a member or disciplining a member may be appealed to the appropriate agency of the American Medical Association upon such terms and conditions and in accordance with such procedure as may be set forth in the Constitution and By-laws of the American Medical Association. Any decision of such agency of the American Medical Association shall be final.

ARTICLE IX

VOTING BY MEMBERS

9.1 No member of the Association shall have any right to vote on any matter affecting the Association, except the right to vote for election of members of the House of Delegates, as hereinafter provided.

9.2 The members of each component society shall annually elect from among the members of such component society one Delegate and one Alternate Delegate to the House of Delegates for each 50 active members of such component society and for any fraction thereof

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s recorded on the books of the Association on December 31 of the preceding year. A component society which has less than 50 active members shall be entitled to elect one Delegate and one Alternate Delegate. Annually during the month of January the Secretary of the Association shall notify each component society of the number of Delegates and Alternate Delegates which its members are entitled to elect for such year. The term of office of each Delegate and each Alternate Delegate shall commence on such date and continue for such period of time as shall be specified by the component society electing him. Only active members of the Association who are members of a component society shall be entitled to vote for the election of or to hold the office of Delegate or Alternate Delegate.

9.3 Voting shall not be cumulative and shall not be by proxy.

9.4 Any Delegate or Alternate Delegate so elected may be removed from the office to which he was so elected by the vote of a majority of the members of the component society which elected him.

ARTICLE X

MEETINGS

10.1 The annual meeting of the Association shall be held at such time and place as the Council may determine. In fixing the time and place of each annual meeting the Council shall follow any directions with respect thereto adopted by the House of Delegates.

10.2 Special meetings of the Association may be called at any time by the President with the consent of two-thirds of the Councilors or shall be called by the President at the request of twenty Delegates representing at least ten component societies.

10.3 All meetings of the Association shall be open to all members and their guests.

10.4 The annual meeting of the House of Delegates shall be held at the same time and place as the annual meeting of the Association and at such time and place as the Council shall determine.

10.5 Special meetings of the House of Delegates may be called at any time by the Speaker or the Vice-Speaker and shall be called by the President at the request of two-thirds of the Councilors or twenty Delegates representing at least ten component societies.

10.6 Written notice of the time and place of each annual meeting and of the time, place and purposes of each special meeting of the Association and of the House of Delegates shall be given by the Secretary to each Delegate and Alternate Delegate not less than five nor more than thirty days prior to the time fixed therefor.

10.7 An annual meeting of the Council shall be held at the time of the annual meeting of the Association at such time and place as the Council may determine.

Special meetings of the Council may be held at such times as the Council may determine or upon the written request of the Chairman of the Council or of any three Councilors.

10.8 Written notice of the time and place of each annual meeting and of the time, place and purpose of each special meeting of the Council shall be given by the Secretary to each member of the Council not less than five nor more than thirty days prior to the time fixed therefor.

ARTICLE XI

HOUSE OF DELEGATES

11.1 The House of Delegates, consisting of the Delegates elected by the component societies as hereinbefore provided, shall be the governing body of the Association. It shall have authority to recommend to the Council from time to time the dues, assessments and other charges payable by members, but no such dues, assessments or other charges shall be recommended except by the affirmative vote of two-thirds of the entire House of Delegates. It shall have authority to appropriate funds of the Association for such purpose or purposes as it deems appropriate, but no appropriation of funds by the House of Delegates shall become effective until approved by the Council.

11.2 The word "Delegate" as used herein refers to a duly elected Delegate or, in his absence or inability to serve, the Alternate Delegate duly authorized to substitute for such Delegate or, in the absence or inability to serve of all duly elected Delegates and Alternate Delegates representing one component society, an Acting Delegate appointed as hereinafter provided. If there is present at any meeting of the House of Delegates no Delegate and no Alternate Delegate from a component society, the House of Delegates may appoint from among the members of such component society present at such meeting Acting Delegates for such component society who shall serve only during the absence of the Delegates and the Alternate Delegates of such component society.

11.3 The House of Delegates shall meet during the annual meeting and at such time or times as may be necessary to complete its business. It may adopt such rules and procedures for the transaction of its business as it deems suitable and shall be the judge of the election and qualification of its members.

11.4 Thirty or more Delegates representing at least 17 component societies shall constitute a quorum. If, at any meeting of the House of Delegates at which a quorum has been present, one or more Delegates withdraws from the meeting so that a quorum is no longer present, the proceedings shall be suspended until a quorum is again present.

11.5 All meetings of the House of Delegates, except executive sessions, shall be open to all members of the Association. The following persons shall have the privilege of attending all meetings of the House of Delegates, except executive sessions, and shall have the

privilege of the floor but no right to vote: the President, the President-elect, the first Vice-President, the Councilors, the Secretary, the Treasurer, the past Presidents, and the Delegates and Alternate Delegates to the American Medical Association. The Speaker or a majority of the Delegates present shall have authority to declare which sessions of the House of Delegates shall be executive sessions and to invite persons who are not Delegates to be present at executive sessions.

11.6 At each annual meeting the House of Delegates shall elect from among the active members of the Association a Speaker and a Vice-Speaker of the House of Delegates, such officers of the Association as are hereinafter provided for, Councilors to replace those whose terms are expiring, and such Delegates and Alternate Delegates to the American Medical Association as this Association may be entitled to elect under the Constitution and By-laws of the American Medical Association.

11.7 The Speaker and Vice-Speaker of the House of Delegates shall be active members of the Association and may, but need not be, elected from among the Delegates and Alternate Delegates. The Speaker and Vice-Speaker shall each serve for a term of one year beginning on the first of the calendar year following his election and thereafter until his successor is elected and qualified.

11.8 Each Delegate to the House of Delegates shall be entitled to one vote. No Alternate Delegate shall be entitled to any vote except during the absence of the Delegate for which he is an Alternate, in which case he may cast the vote which such Delegate would be entitled to cast were such Delegate present. Voting shall not be cumulative nor by proxy. Neither the Speaker nor the Vice-Speaker shall have any vote except in the case of a tie vote, in which case the Speaker or, in his absence, the Vice-Speaker may cast one vote.

11.9 The Speaker shall be the presiding officer at all meetings of the House of Delegates and shall perform such duties as custom and parliamentary usage require. The Speaker shall have authority to appoint such reference or other committees as he deems necessary to carry out the business of the House of Delegates. Members of all such committees shall be Delegates or Alternate Delegates.

11.10 The Speaker shall, prior to each annual meeting, appoint a Nominating Committee to report to the annual meeting a slate of candidates for the offices of Speaker and Vice-Speaker and for the offices of the Association (exclusive of Councilors and Delegates and Alternate Delegates to the American Medical Association) to be filled at such annual meeting. Such Nominating Committee shall consist of one Delegate or Alternate Delegate from each Councilor District. The Speaker shall designate the Chairman of the Nominating Committee and shall serve as an ex officio member thereof. The Speaker shall obtain from each Councilor

the name of one member from such Councilor's district whom such Councilor believes qualified to serve as first Vice-President and shall submit the list of such name to the Nominating Committee. After the Nominating Committee has made its report to the House of Delegates, any Delegate may nominate any eligible member for any office of the Association to be filled at such annual meeting.

11.11 Either the Speaker or the Vice-Speaker may be removed from his office at any time with or without cause by the affirmative vote of two-thirds of the entire House of Delegates.

11.12 In the event of the absence of the Speaker or inability of the Speaker to serve, the Vice-Speaker shall succeed to his powers and duties. In the event of the death, resignation or removal of the Speaker, the Vice-Speaker shall automatically succeed to the office of the Speaker for the unexpired term.

ARTICLE XII

COUNCIL

12.1 Between sessions of the House of Delegates the affairs of the Association shall be managed by a Board of Directors which shall be known as the Council, and the members of which shall be known as Councilors. It shall have authority to do and perform all acts and functions which the House of Delegates might do or perform not inconsistent with the Articles of Incorporation and By-laws or with any action taken by the House of Delegates.

12.2 Each Councilor shall be designated to represent one Councilor District. The House of Delegates shall, upon recommendation of the Council, establish a number of Councilors, which shall never be less than three, group the component societies into Councilor Districts, and set the number of Councilors designated to represent each Councilor District.

12.3 Each Councilor shall serve for a term of three years beginning on the first of the calendar year following the date of his election. The terms of all the Councilors shall be so arranged that, as nearly as possible, one-third shall be elected each year.

12.4 At each annual meeting the House of Delegates shall elect a Councilor to fill the term of each Councilor whose term expires at the end of that year. At least one month in advance of each annual meeting of the House of Delegates, the Delegates in each Councilor District for which a Councilor is to be elected shall hold a caucus at which they shall select a nominee for the office of Councilor and the name of such nominee shall be submitted to the House of Delegates for its consideration. The Speaker shall designate one component society Secretary within each Councilor District concerned to assume the responsibility for setting the date, place and time for such caucus. The Delegates present at such caucus shall select a Chairman who shall present to the House of Delegates the name of the nominee so selected. At the annual meeting of

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The House of Delegates other nominations for the office of such Councilor may be made from the floor. No person may be nominated for or elected to the office of Councilor for any Councilor District unless he be a member of the component society or one of the component societies in such Councilor District and an active member of the Association.

12.5 Any Councilor may be removed from his office at any time with or without cause by the affirmative vote of two-thirds of the entire House of Delegates.

12.6 The President, the first Vice-President, the President-elect, the last past President, the Secretary, the Treasurer, the Speaker and the Delegates and Alternate Delegates to the American Medical Association shall be ex officio members of the Council but without the right to vote.

12.7 A majority of the voting members of the Council shall constitute a quorum for the transaction of business, provided, however, that if a vacancy exists by reason of death, resignation or otherwise, a majority of the remaining Councilors shall constitute a quorum for the purpose of filling such vacancy.

12.8 If there be any vacancy in the office of any Councilor or in any office of the Association or in any office of Delegate or Alternate Delegate to the American Medical Association by reason of death, resignation or otherwise, the Council may fill such vacancy for a period ending at the expiration of the term of such office or the next annual meeting of the House of Delegates, whichever shall first occur.

12.9 The Council, or such members thereof as may be designated by the Chairman, shall serve as the Finance Committee of the Association and shall present to each annual meeting of the House of Delegates a report of the Finance Committee. The Chairman shall have authority to appoint three members of the Council to serve as a subcommittee on finance to make recommendations to the Council.

12.10 At each annual meeting of the Council, the Council shall elect a Chairman to serve until the next annual meeting of the Council and until his successor is elected and qualified. At each annual meeting of the Council shall also elect a Clerk who, in the absence of the Secretary of the Association, shall keep a record of the proceedings of the Council.

12.11 The Council may, by order of the Chairman or by the vote of a majority of its voting members present, go into executive session, such executive session to be limited to only the voting members and such others as may be invited to remain by the Chairman or by a majority of its voting members.

12.12 The Secretary of the Association shall keep a record of all the proceedings of the Council, except

those from which he is excluded by reason of the same being an executive session.

12.13 The Chairman of the Council shall present to each annual meeting of the House of Delegates a report of the activities of the Council during the preceding year.

12.14 At each annual meeting of the House of Delegates the Council shall present a list of nominations for Delegates and Alternate Delegates to the American Medical Association. Additional nominations may be made from the floor.

12.15 The Council shall have authority to employ such persons, including an Executive Secretary, as it deems necessary to carry out the work of the Association and to employ such independent public accountant or firm of independent public accountants as it deems appropriate to audit the accounts of the Association. It shall have authority to determine the compensation to be paid to any of the foregoing.

12.16 The Council shall provide for and superintend the publication and distribution of all proceedings and transactions of the Association and of Minnesota Medicine. It shall appoint the editor and members of the Board of Editors of Minnesota Medicine and determine the compensation to be paid to each.

12.17 All bonds, stocks, mortgages, contracts, notes, debentures and other negotiable instruments and all other real and personal property, of every nature whatsoever, that may be owned or held by the Association may be sold, transferred or assigned, in accordance with the order of the Council. The Chairman of the Council or the President of the Association and the Treasurer, Secretary or Executive Secretary of the Association are empowered to, and shall, execute such instrument or instruments of sale, transfer or assignment as may be necessary to affect or consummate any such sale, transfer or assignment in accordance with the order of the Council. The Chairman of the Council or the President of the Association and the Treasurer, Secretary or Executive Secretary are authorized to execute any and all contracts of the Association.

12.18 Each Councilor shall supervise the component societies in his Councilor District. He shall visit the counties in his Councilor District when necessary for the purposes of organizing component societies where none exist, of inquiring into the conditions of the medical profession in such societies, of improving and increasing the activities of the component societies and their members, and of acting as peacemaker for his Councilor District. The actual expenses incurred by each Councilor and each Councilor-elect in connection therewith and in connection with attendance at special meetings of the Council shall be paid to such Councilor against a properly itemized statement. Nothing contained herein shall be construed to authorize payment to a Councilor of his expenses while in attendance at the annual meeting of the Association.

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ARTICLE XIII

COMMITTEES

13.1 The Council shall have authority to create such committees as it deems appropriate and to establish the authority and duty of each committee. There shall be two classes of committees, to-wit: scientific and non-scientific. The President and the Secretary of the Association shall be ex officio members of all committees. All committees are responsible and shall report to the Council, except during periods when the House of Delegates is in session. Each committee shall at each annual meeting of the House of Delegates make a report to the House of Delegates of its activities during the preceding year.

13.2 The scientific committees shall be appointed by the President with the approval of the Council.

13.3 The non-scientific committees shall be appointed by the Council.

13.4 The members of each committee shall be appointed for a term of one year, commencing on the January 1 following the date of their appointment unless otherwise stipulated by the appointment.

ARTICLE XIV

OFFICERS

14.1 The officers of the Association shall consist of a President, a President-elect, two Vice-Presidents, a Secretary and a Treasurer. At each annual meeting the House of Delegates shall elect a President-elect, a first Vice-President, a second Vice-President, a Secretary and a Treasurer, each of whom shall be an active member of the Association. No person shall be elected to the office of President-elect who has not been a member of the Association for at least two years prior thereto.

14.2 The President-elect shall serve as such until the first of the calendar year following his election, at which time he shall become President and serve as such for a period of one year, and thereafter until his successor is elected and qualified. Each other officer shall serve for a period of one year commencing on the first of the calendar year following his election and thereafter until his successor is elected and qualified.

14.3 Any officer of the Association and any Delegate or Alternate Delegate to the American Medical Association may be removed by the affirmative vote of a majority of the entire Council.

14.4 In the event of the absence or inability to serve of the President, the first Vice-President shall succeed to his powers and duties.

14.5 The President shall preside at all meetings of the Association, except at meetings of the House of Delegates or of the Council. He shall be an ex officio member of the House of Delegates and the Council, but without the right to vote. He shall appoint, with the approval of the Council, all scientific committees. He shall deliver an annual address at the annual meet-

ing of the Association and perform such other duties as may be delegated to him by the House of Delegates or the Council.

14.6 The President-elect shall be an ex officio member of the House of Delegates and of the Council but without the right to vote.

14.7 The Vice-Presidents shall assist the President in the discharge of his duties in such manner as he may authorize and shall perform such other duties as may be conferred upon them by the Council. The first Vice-President shall be an ex officio member of the House of Delegates and the Council, but without the right to vote.

14.8 The Treasurer shall give bond in such sum as the Council may require and the expense of such bond shall be borne by the Association. He shall be an ex officio member of the House of Delegates and of the Council, but without right to vote. He shall authorize the disbursement of funds out of the treasury upon the written order of the Chairman of the Council and the Secretary of the Association and shall, when authorized by the Council, establish one or more special bank accounts upon which persons other than those named above may be authorized to draw. At each annual meeting he shall render to the House of Delegates an accounting of the receipts and expenditures of the Association during the preceding fiscal year of the Association and his accounts shall be subject to such examination as the House of Delegates may order. The Treasurer may delegate any of the powers and duties herein conferred upon him to any assistant or assistants that the Council may employ. The amount of his salary shall be fixed by the Council.

14.9 The Secretary shall give bond in such sum as the Council may require and the expense thereof shall be borne by the Association. The Secretary shall attend meetings of the Association, of the House of Delegates and of the Council and shall keep minutes of the proceedings thereof in a separate record book for each. He shall be ex officio Secretary of the Council and of the House of Delegates, but without the right to vote.

The Council may appropriate moneys of the Association to be placed in one or more revolving funds maintained by the Secretary and from which the Secretary may make such disbursements for purposes of the Association as he deems necessary.

The Secretary shall provide for the registration of all members and delegates at annual meetings of the Association and shall act as General Manager of the annual meetings. Subject to the supervision and direction of the Council, he shall arrange for and have charge of the scientific and technical exhibits at each annual meeting and collect and deposit in a special fund amounts received in connection therewith. He shall be authorized to draw on such fund for expenses in connection with each annual meeting, but at the conclusion thereof shall turn the balance of such fund over to the Treasurer.

The Secretary shall notify members of meetings, offi-

ers of their election and committees of their appointments and duties. He may delegate any of the powers and duties herein conferred upon him to any assistant or assistants that the Council may employ. He shall supply each component society with the necessary blanks for making its annual report, keep an account with each component society showing the dues, assessments and other charges payable by each member thereof, collect the same and turn the same over to the Treasurer. The amount of his salary shall be fixed by the Council.

The Secretary shall, with the co-operation of the secretaries of the component societies, keep a register of all physicians licensed to practice in the State of Minnesota by counties, noting therein the status of each physician in relation to his component society, and upon request shall transmit a copy of this list to the American Medical Association.

14.10 All books, records and papers belonging to the Association shall be maintained in the principal office of the Association.

ARTICLE XV

AMENDMENTS

15.1 These By-laws may be amended at any special or annual meeting of the House of Delegates by the affirmative vote of a majority of the Delegates voting thereon; provided that the Council by resolution has proposed such amendment and directed that it be submitted to the House of Delegates for adoption; and provided that written notice of such meeting, stating the purpose, shall have been given not less than five nor more than thirty days prior to the time fixed therefor to each Delegate and Alternate Delegate of the House of Delegates and to each Councilor and officer of the Association, regardless of his voting rights.

CURRENT CONCEPTS OF OSTEOPOROSIS

(Continued from Page 175)

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Minnesota State Medical Association

104th Annual Meeting

Preliminary Program Plans

The Committee on Scientific Assembly of the Minnesota State Medical Association has announced preliminary plans for the 104th annual meeting of the Association to be held May 13, 14, and 15, 1957, in St. Paul. A complete program will appear in the April issue of MINNESOTA MEDICINE.

Dr. J. A. Bargaen, Rochester, president of the state association, is general chairman of the Committee on Scientific Assembly. Other members include Dr. R. H. Wilson, Winona, past president, and R. R. Rosell, St. Paul, executive secretary. Dr. Donald S. Amatuzio, Minneapolis, and Dr. W. S. Neff, Virginia, represent the section on medicine; Dr. R. P. Buckley, Duluth, and Dr. J. P. Medelman, St. Paul, the section on specialties; and Dr. B. M. Black, Rochester, and Dr. W. O. Finkenburg, Winona, the section on surgery. Dr. Wallace P. Ritchie, St. Paul, is general chairman of the committee on local arrangements.

The tentative program is as follows:

MONDAY, MAY 13

9:00 A.M.—Panel Discussion on "Heart Disease in Pregnancy," sponsored by the Minnesota Heart Association
DR. RODNEY F. STURLEY, St. Paul, *Chairman*
DR. JOHN F. BRIGGS, St. Paul, *Moderator*

"Surgery of the Heart in the Pregnant Patient"
DR. CHARLES P. BAILEY, Philadelphia, Pennsylvania

"Medical Aspects"
DR. JAMES METCALFE, Boston, Massachusetts

"Control Of Hypertension"
DR. NICHOLAS AASLI, Los Angeles, California

"Obstetric Problems"
DR. I. H. KAISER, University of Minnesota

10:15 A.M.—Intermission

11:00 A.M.—RUSSELL D. CARMAN MEMORIAL LECTURE
PROF. DR. HANS HEINRICH BERG, Hamburg, Germany

12:15 P.M.—ROUND TABLE LUNCHEONS

2:00 P.M.—Panel Discussion, "The Acute Abdomen"
DR. HENRY L. BOCKUS, Philadelphia, Pennsylvania, *Moderator*
DR. N. LOGAN LEVEN, St. Paul
DR. LEO G. RIGLER, University of Minnesota
DR. HARRY B. NEEL, Albert Lea
DR. J. C. CAIN, Rochester

3:15 P.M.—Intermission

4:00 P.M.—"Iatrogenic Disorders in Gastroenterology"
DR. HENRY L. BOCKUS, Philadelphia

6:00 P.M.—Special Dinners

TUESDAY, MAY 14

9:00 A.M.—Panel Discussion, "Functional Disorders"
"Gastrointestinal Aspects," DR. R. S. YLVIKAKER, Minneapolis
"Gynecology," DR. E. A. BANNER, Rochester
"Dermatology," DR. F. T. BECKER, Duluth
"Tension States," DR. H. O. BECK, St. Paul
Question-and-answer period

10:00 A.M.—Presidential Address
DR. J. A. BARGEN, Rochester

10:15 A.M.—Intermission

11:00 A.M.—ARTHUR H. SANFORD LECTURE
"Essentials of Endometrial Pathology"
DR. ARTHUR T. HERTIG, Boston, Massachusetts

12:15 P.M.—ROUND TABLE LUNCHEONS

2:00 P.M.—Panel Discussion, "Palliative Treatment of Cancer"
"Use of Hormones," DR. B. J. KENNEDY, University of Minnesota
"By Neurosurgery," DR. R. L. MERRICK, St. Paul
"Radiation Therapy," DR. DONALD S. CHILDS, Rochester
"By Drugs," DR. JOHN LUNDY, Rochester

3:15 P.M.—Intermission

4:00 P.M.—MINNESOTA DIVISION, AMERICAN CANCER SOCIETY LECTURE
"Chemotherapy of Cancer"
DR. C. P. RHOADS, Sloan-Kettering Institute for Cancer Research, New York City

7:00 P.M.—Annual Banquet
Speaker: REAR ADMIRAL HYMAN G. RICKOVER, Washington, D. C.
Presentation of Fifty Club, Special Awards

PRELIMINARY PROGRAM

WEDNESDAY, MAY 15

9:00 A.M.—NORTHWESTERN PEDIATRIC SOCIETY LECTURE

"Endocrinopathies in Children"

DR. VINCENT KELLEY, Salt Lake City, Utah

9:40 A.M.—MINNESOTA MEDICAL FOUNDATION LECTURE

"The Practical Appraisal of Liver Function"

DR. CECIL WATSON, University of Minnesota

10:15 A.M.—Intermission

11:00 A.M.—"The Menopause and Thereafter"

DR. WILLIAM H. MASTERS, Associate Professor of Obstetrics and Gynecology, Washington University School of Medicine, St. Louis, Missouri

11:30 A.M.—MINNESOTA ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY LECTURE

"Functional Disorders of the Nose"

DR. C. STEWART NASH, Rochester, New York

12:15 P.M.—ROUND TABLE LUNCHEONS

2:00 P.M.—Panel Discussion, "Management of Acute Injuries"

DR. CLAUDE HITCHCOCK, Minneapolis, Moderator

"Shock," DR. RALPH SMITH, Veterans Hospital, Minneapolis

"Head," DR. HAROLD F. BUCHSTEIN, Minneapolis

"Chest," DR. LYLE TONGEN, St. Paul

"Vascular Injuries," DR. JOHN IVINS, Rochester

The sessions will be held at the St. Paul Municipal Auditorium; special dinners and luncheons will be primarily at Hotels Saint Paul and Lowry in St. Paul.

The Woman's Auxiliary to the state medical association will hold its annual meeting at the same time with headquarters at Hotel Lowry. Mrs. W. P. Gardner and Mrs. W. P. Ritchie, St. Paul, are co-chairmen for Auxiliary activities.

HIGHWAY DEATH TOLL CALLS FOR "TEAMWORK"

As the accident and death toll from highway auto accidents mount, it takes a "team approach" by doctors to care adequately for many of the accident victims.

This is the report of a St. Joseph, Mo., radiologist, Dr. Jacob Kulowski. He has made a detailed study of the x-ray aspects of car accidents and reported his conclusions in the January, 1957, issue of *The American Journal of Roentgenology, Radium Therapy and Nuclear Medicine*.

"Medical concern is growing in regard to the increasing toll of life and limb being exacted on our highways. With the advent of techniques and methods of studying these accidents, the evolution of medical participation may be expressed as advancing from a 'do-it-yourself' attitude to a 'do-it-together' plan of medical action," Dr. Kulowski pointed out.

Some of his other conclusions:

Drivers with cervical arthritis are more prone to rear-end and impacts from an angle—especially at intersections. It is possible that the circular and rocker action of the cervical spine, which is needed to meet these danger cues at intersections, is inadequate in some of these drivers. That is, movement of the neck to supplement the field of vision to either side is inadequate.

Some persons, who might cringe from a mouse, have not acquired a sense of the dangerousness of some aspects of motoring; these people assume an imaginary protection which doesn't exist.

Radiologists can improve first aid by urging against poor handling of simple fractures which sometimes causes a compound fracture.

Some statistics revealed in Dr. Kulowski's report:

Among motoring casualties who reach a hospital, 45 per cent are hurt to a minor degree; 45 per cent are more severely injured; and 10 per cent are severely or dangerously hurt.

Of those 10 per cent severely hurt, about 15 per cent die outright at the scene of the accident; of those severely hurt who reach the hospital, about two-thirds die within the first forty-eight hours, the rest at varying times.

The immediate deaths are due to primary, irreversible shock to vital functions. Deaths which occur soon afterwards are also due to primary shock.

Plan Now to Attend the 104th Annual Meeting of the Minnesota State Medical Association, Saint Paul, May 13, 14 and 15, 1957.

Medical-Legal Opinions

JULE M. HANNAFORD, Legal Counsel
Minnesota State Medical Association

These opinions were prepared by Jule M. Hannaford, legal counsel for the Minnesota State Medical Association. Mr. Hannaford is a partner with the firm of Dorsey, Owen, Barker, Scott and Barber, Minneapolis.

TEST FOR ALCOHOL

When a person's competence to operate an automobile is questioned, police officers frequently request specimens or blood samples of the person and analyses for alcoholic content. This raises various legal problems.

The problem arises generally when a person is brought by a police officer to a physician's office or to a hospital with the request that a specimen or blood sample be taken and that a report of the analysis thereof be given to the police officer. The request may be made and the specimen or blood sample taken by a physician or some technician who does not hold a degree of a Doctor of Medicine.

Two legal principles are involved in such a situation. The first has to do with the right of the physician or technician to take a specimen or a blood sample. The second has to do with the admissibility in evidence of an analysis of the specimen or blood sample in a prosecution for drunken driving. Each will be discussed in turn and certain suggestions for handling such a situation will be advanced.

I

Neither a physician nor a technician may apply a medical procedure to a person without the person's consent. A physician or technician who does so commits an assault and can be held responsible for the resulting damages. The taking of a specimen or a blood sample is a medical procedure within the foregoing rule and cannot, therefore, be done without risk unless consent is first obtained.

The foregoing conclusion is not altered by reason of the fact that the taking of the specimen or the blood sample was done at the request of a police officer. The constitution prohibits unreasonable searches and seizures and also prohibits compelling a person to give evidence against himself. A police officer who violates these prohibitions and the persons who assist him may be committing a crime and can be held responsible for the resulting damages. The taking of a specimen or a blood sample without the consent of the person from whom they are taken would prob-

ably be considered a violation of these prohibitions and could not, therefore, be done without risks unless consent is first obtained.

The consent that will protect either a physician or a technician may be either actual or implied. Actual consent results when the person gives his consent orally or in writing. Implied consent results when the person cooperates with the physician or technician by voluntarily giving a specimen or permitting a blood sample to be taken.

II

The Minnesota Legislature at its 1955 session passed a law which states that in prosecution for drunken driving "the court may admit evidence of the amount of alcohol in the person's blood taken voluntarily within two hours of the time of arrest as shown by medical or chemical analysis of his breath, blood, urine or saliva." Section 169.12 Minn. Stats. The statute goes on to state that .05 per cent or less by weight of alcohol in a person's blood is *prima facie* evidence he was not drunk, .15 per cent or more is *prima facie* evidence that he was drunk, and more than .05 per cent but less than .15 per cent is relevant but not *prima facie* evidence as to his condition.

Prior to the enactment of this statute it was not clear whether an analysis of a specimen or a blood sample which had been obtained without the defendant's consent could be admitted in evidence. The statute by using the phrase "taken voluntarily" would seem to make it clear that such an analysis is not admissible unless the defendant's consent has been obtained. However, it is not clear how extensive the consent must be. Is it sufficient if the person voluntarily gives a specimen or permits the taking of a blood sample? Or must he also consent to having an analysis made? Or before he consents must he be told that the analysis will be for alcoholic content and will be given to the police and consent to this as well? The statute is so new that the Minnesota courts have not as yet answered these questions and the courts of other states are divided in their answers. It does, however, seem clear that if the defendant consents to the taking of the specimen or blood sample, to the making of an analysis for alcoholic content, and to the giving of the

analysis to the police officer, then he has no grounds under the statute to object to the admission of the analysis.

The defendant might also object to the admission of the analysis on the ground that it is a privileged communication. Section 595.02 of Minn. Stats. provides in part as follows:

"A licensed physician or surgeon shall not, without the consent of a patient, be allowed to disclose any information or any opinion based thereon which he acquired in attending the patient in a professional capacity, and which was necessary to enable him to act in that capacity."

This statute relates to information obtained by a licensed physician or surgeon. Therefore, if the specimen or blood sample is taken and analyzed by a technician and if no physician or surgeon directs the technician or treats the defendant, the defendant probably could not object to the admission of the analysis on the basis of the foregoing statute. Moreover, the statute prohibits the disclosure of only such information as is necessary to enable a physician or surgeon to treat the defendant in a professional capacity. Therefore, if the defendant is not injured and does not need treatment for alcoholism or some other condition, the information would not have been acquired while attending the defendant and the defendant probably would not be in a position to claim privilege. It would, therefore, seem that a defendant could claim the benefits of the foregoing statute only if the specimen or blood sample were taken by a physician or surgeon or under his direction and were so taken for the purpose of treating the defendant in a professional capacity.

III

As a result of the foregoing we are of the opinion that when a potential defendant is brought to a physician or a technician by a police officer with the request that a specimen or blood sample be taken and analyzed, the physician or technician should not do so unless the potential defendant is informed that the specimen or blood sample will be analyzed for alcoholic content and consents not only to the taking of the specimen or the sample

but also to its analysis and the delivery of a copy of the analysis to the police officer. The only exception to this general rule should be in cases where because of injury, intoxication or some other condition the physician believes that medical treatment is required and that a specimen or blood sample is needed for such purpose. In such cases it is, of course, proper to take a specimen or blood sample, but we believe the analysis should not be turned over to the police until the patient has recovered to a sufficient extent so that there can be no question as to his rationality, until he has been advised of the purpose for which the analysis may be used and until he consents thereto.

We have two further suggestions. First, if the physician or technician is given a choice between taking a specimen or a blood sample, we would recommend he take a specimen because the patient will normally co-operate in its taking and will, therefore, have difficulty in arguing he did not impliedly consent. Secondly, while a physician or technician would run little risk if the police officer took the specimen or blood and if the physician or technician limited his activity to making the analysis, we would not suggest such a solution when the taking is done in the physician's office or in a hospital. If a proper consent is not obtained in such a case, we fear the physician or the hospital would be held equally liable with the police officer on a conspiracy theory because his or its facilities were used by the police officer.

To obviate the problems outlined above, several bills have been introduced in the current session of the Minnesota Legislature which require a person, when applying for a driver's license, to consent in writing to the taking of a blood sample or a specimen if arrested for drunken driving. If such a bill is passed, it will in time relieve the physician from the necessity of bothering with consents each time he is to take a blood sample or specimen. However, as Minnesota drivers' licenses need be renewed only every four years, it will be at least four years after the bill is passed before all Minnesota drivers have signed such a consent. Moreover, it should be remembered that non-residents who do not have a Minnesota driver's license will not have signed such a consent.

History has proved time and time again that tuberculosis recedes wherever social and economic conditions assure for man an environment conducive to physical well-being and happiness. It has often been pointed out that the mortality caused by tuberculosis, and by other microbial diseases as well, had begun to decrease before the campaigns based on the germ theory had been put into effect. The campaign against infection

began with the great public health reforms. The early pioneers of the public health movement were little concerned with germs, but they knew that an effective way to combat consumption and other "infectious fevers" was to assure for each citizen good air, pure water, adequate food, and pleasant and happy surroundings, both at work and at play.—RENE J. DUBOS, Ph.D., *Nat. Tuberc. A. Tr.*, May, 1954.

Meetings and Announcements

STATE

MINNESOTA STATE MEDICAL ASSOCIATION, 104th annual meeting, Saint Paul, May 13, 14 and 15, 1957.

NATIONAL

American Congress of Physical Medicine and Rehabilitation, thirty-fifth annual scientific and clinical session, Los Angeles, September 8-13, 1957.

The Children's Hospital of Philadelphia. Three short refresher courses. "Pediatric Advances for Pediatricians and General Practitioners," May 27-31, 1957. "Practical Pediatric Hematology," June 3-5, 1957. "Blood Group Incompatibilities and Erythroblastosis Fetalis," June 6-7, 1957. Irving J. Wolman, M.D., Children's Hospital of Philadelphia, 1740 Bainbridge Street, Philadelphia 46, Pennsylvania.

Eighth Annual Symposium on the Recent Advances in the Study of Venereal Diseases, Department of Health, Education and Welfare Auditorium, Washington, D. C., April 24-25.

First American Post-Graduate Assembly in Fertility and Sterility, New York Medical College-Metropolitan Medical Center, May 18-31. Dr. Ralph E. Snyder, Dean, New York Medical College, 1249 Fifth Avenue, New York 29, New York.

New York University Post-Graduate Medical School. Part-time review course in cardiology for general physicians and internists. Thursdays, 2-5 p.m., April 11 to May 23, 1957. Full-time review course on cardiology, May 6-24, 1957. The Dean, Post-Graduate Medical School, 550 First Avenue, New York 16, New York.

New York University Post-Graduate Medical School. Course on Orthopedic Aspects of the Treatment of Rheumatic Disorders, three successive Thursdays, from March 19 through April 2. The Dean, New York Post-Graduate Medical School, 550 First Avenue, New York 16, New York.

New York University Post-Graduate Medical School. Management of Chronic Kidney Diseases, June 24-25, Dr. Lawrence G. Wesson. Office of Associate Dean, New York University Post-Graduate Medical School, 550 First Avenue, New York 16, New York.

New York University Post-Graduate Medical School. Management of Hypertension, June 26-27, Dr. J. Marion Bryant. Office of Associate Dean, New York University Post-Graduate Medical School, 550 First Avenue, New York 16, New York.

Ninth Annual Scientific Assembly of the American Academy of General Practice, March 25-28, St. Louis, Missouri.

Postgraduate Course on Gastroenterology, University of Colorado School of Medicine, Denver, Colorado, May 13-15, 1957. Co-sponsored by the American Gastroenterological Association. Office of Postgraduate Medical Education, University of Colorado Medical Center, 4200 East Ninth Avenue, Denver 20, Colorado.

Thirteenth Annual Spring Congress in Ophthalmology, Otology, Rhinology, Laryngoscopy, Faci-maxillary Surgery, Bronchoscopy and Esophagoscopy; Gill Memorial Eye, Ear and Throat Hospital, Roanoke, Virginia, April 1-6, 1957.

University of Pittsburgh School of Medicine, Department of Surgery, Section of Anesthesiology—Postgraduate Symposium on the Basic Sciences Related to Anesthesiology, June 10-14, 1957. Write to Chairman of the Committee on Graduate Medical Education, University of Pittsburgh School of Medicine, 3941 O'Hara Street, Pittsburgh 13, Pennsylvania.

INTERNATIONAL

Canadian Medical Association, Edmonton, Alberta, Canada, June 17-21. Dr. A. D. Kelly, 150 St. George Street, Toronto 5, Ontario, Canada.

Congress of International Association for Study of the Bronchi, Lisbon, Portugal, May 25-26, Prof. F. Lopo de Varvalho, 138 rua de Junqueira, Lisbon, Portugal.

Congress of International Society for Cell Biology, St. Andrews, Fife, Scotland, August 28-September 3. Prof. H. G. Callan, Bell Pettigrew Museum, The University, St. Andrews, Fife, Scotland.

Congress of International Society of Orthopedic Surgery and Traumatology, Barcelona, Spain, September 16-21. International Society of Orthopedic Surgery and Traumatology, 34 rue Montoyer, Brussels, Belgium.

Congress of International Society of Surgery, Mexico City, Mexico, October 27-November 2. Dr. L. Dejardin, 141 rue Belliard, Brussels, Belgium.

Fourth International Poliomyelitis Conference, Geneva, Switzerland, July 8-12. Registration deadline, April 1. Fourth International Poliomyelitis Conference, Secretariat, Hotel du Rhone, Geneva, Switzerland.

Inter-American Congress of Pan American Medical Association, Mexico City, Mexico, November 18-22. Dr. Joseph J. Eller, 745 Fifth Avenue, New York 22, New York.

Inter-American Medical Convention, Hotel El Panama, Panama City, Republic of Panama, April 3-5, 1957. Dr. William T. Bailey, Medical Association of the Isthmian Canal Zone, Box "E", Balboa Heights, Canal Zone.

International Conference on Audiology, St. Louis,

MEETINGS AND ANNOUNCEMENTS

Missouri, May 13-16. Dr. S. Richard Silverman, 818 South Kingshighway, St. Louis, Missouri.

International Congress of Clinical Pathology, Brussels, Belgium, July 15-20. Prof. M. Welsch, Universite de Liege, 32 Blvd. de la Constitution, Liege, Belgium.

International Congress of Dermatology, Stockholm, Sweden, July 31-August 6. Dr. C. H. Floden, Karolinska, Sjukhuset, Hudkliniken, Stockholm 60, Sweden.

International Congress of Electroencephalography and Clinical Neurophysiology, Brussels, Belgium, July 21-28. Dr. R. G. Bickford, Mayo Clinic, Rochester, Minnesota.

International Congress of International Society of Gastroenterology, Philadelphia, Pennsylvania, May 2-13. Dr. Chevalier L. Jackson, 3401 North Broad Street, Philadelphia.

International Congress on Medicine and Surgery, Turin, Italy, June 1-9. Secretariat, Minerva Medica, Corso Bramante 83-85, Turin, Italy.

International Congress of Neurological Sciences, Brussels, Belgium, July 21-28. Dr. Pearce Bailey, National Institutes of Health, Bethesda 14, Maryland.

International Congress of Neurosurgery, Brussels, Belgium, July 21-28. Dr. William B. Scoville, 85 Jefferson Street, Hartford, Connecticut.

International Congress of Neuropathology, Brussels, Belgium, July 21-28. Dr. Ludo J. Bogaert, 47 rue de Harmonie, Antwerp, Belgium.

International Congress of Nutrition, Paris, France, July 24-29. Congress International de Nutrition, 71 Blvd. Pereire, Paris 17e, France.

International Congress of Otolaryngology, Washington, D. C., May 5-10. Dr. Paul H. Molinger, 700 North Michigan Avenue, Chicago 11, Illinois.

International Congress on Rheumatic Diseases, Toronto, Ontario, Canada, June 23-28. International Congress on Rheumatic Diseases, P.O. Box 237, Terminal "A," Toronto, Ontario.

International Gerontological Congress, Merano-Bolzano, Italy, July 14-19. Segreteria, Quarto Congresso Internazionale de Gerontologia, Viale Morgagni, 85, Firenze, Italy.

International League Against Epilepsy, Brussels, Belgium, July 21-28. Dr. Radermecker, Institut Bunge, 59 rue Philippe Milliot, Berchem, Antwerp, Belgium.

International Symposium on Medical-Social Aspects of Senile Nervous Diseases, Venice, Italy, July 20-21. Secretariate, Viale Morgagni 85, Firenze, Italy.

International Voice Conference (Laryngeal Research Function and Therapy), Chicago, Illinois, May 20-22. Dr. Hans von Leden, 30 North Michigan Avenue, Chicago 2, Illinois.

Neuroradiologic Symposium, Brussels, Belgium, July 1-28. Professor Melot, Hôpital Universitaire St. Pierre, Brussels, Belgium.

Pan American Congress on Cancer Cytology, Eden Roc Hotel, Miami Beach, Florida, April 25-29, 1957.

Dr. J. Ernest Ayre, 1155 N.W. 14th Street, Miami, Florida.

Pan-Pacific Surgical Association, seventh congress, Honolulu, Hawaii, November 14-22, 1957. Write Dr. F. J. Pinkerton, director-general of the Pan-Pacific Surgical Association, Room 230, Young Building, Honolulu, Hawaii.

William Harvey Tercentenary Congress, Royal College of Surgeons, London, England, June 3-7, 1957. Dr. D. Geraint James, Harveian Society of London, 11 Chandos Street, Cavendish Square, London W. 1, England.

WORLD CONGRESS OF GASTROENTEROLOGY

The World Congress of Gastroenterology will be held May 25-31, 1958, at the Sheraton Park Hotel in Washington, D. C. An attendance of about 3,000 physicians is expected, with representatives from most of the nations outside the Iron Curtain. Subjects to be discussed include peptic ulcer, malabsorption in sprue syndrome, nutrition and its effects on the liver and pancreas, intestinal infection and infestation and cancer of the stomach. Inquiries for further information should be addressed to Dr. H. M. Pollard, University Hospital, University of Michigan, Ann Arbor, Michigan. Dr. Pollard is secretary-general of the Congress.

TENTH ANNUAL POSTGRADUATE COURSE ON DISEASES OF THE CHEST

The Tenth Annual Postgraduate Course on Diseases of the Chest, sponsored by the Council on Postgraduate Medical Education of the American College of Chest Physicians and the Laennec Society of Philadelphia, will be held April 1-5, 1957, at the Bellevue-Stratford Hotel, Philadelphia, Pennsylvania. A fee of \$75.00 will be charged for the course, which gives forty-two hours of informal credit toward postgraduate education requirements of the American Academy of General Practice. Credits will also be given to applicants for Fellowship in the American College of Chest Physicians.

General subjects to be discussed in this course are: Nontuberculous diseases, Physiology, Tuberculosis, Cancer of the Bronchi and Lungs, Radiology, Cardiology, the Esophagus, and Esoteric Diseases. Five round table luncheon meetings and a dinner meeting will be held.

Further information may be obtained from the American College of Chest Physicians, 112 East Chestnut Street, Chicago 11, Illinois.

CONGRESS OF PHYSICAL MEDICINE AND REHABILITATION TO MEET AT ROCHESTER

The next meeting of the Midwestern Section of the American Congress of Physical Medicine and Rehabilitation will be held in Rochester, Minnesota, at the Mayo Clinic, May 3-4, 1957. In addition to a scientific session there will be tours of the various facilities in the Mayo Clinic. Those interested in attending should contact Dr. Gordon M. Martin, Section of Physical Medicine and Rehabilitation, Mayo Clinic, Rochester, Minnesota.

STATE MEDICAL ASSOCIATION OFFERS SCIENCE FAIR SCHOLARSHIP

The Minnesota State Medical Association is sponsoring a \$225 scholarship for the best exhibit in the biologic sciences by a Minnesota high school student at the 1957 state science fairs. The purpose of these fairs is to increase interest in the study of science at the high school level.

RURAL MEDICAL SCHOLARSHIP AWARDED TO ANOKA MAN

The 1957 rural medical scholarship award sponsored by the Minnesota State Medical Association has been presented to Vincent R. Hunt, age twenty-two, Anoka, a freshman at the University of Minnesota Medical School. Hunt graduated with honors from St. John's University, Collegeville, in May, 1956. He is one of seven children and the son of Mrs. V. R. Hunt, a teacher in the Anoka school system, and the late Mr. Hunt, former Northfield, Minnesota, high school coach.

Under the provisions of the scholarship, Hunt will receive \$1,000 each year for four years. In return he must promise to practice medicine in a town of 5,000 or less population for five years after his graduation. He is the fifth rural scholarship recipient; the first, Richard Engwall, Winthrop, has received his medical degree.

MEDICAL CONTINUATION COURSES AT THE UNIVERSITY OF MINNESOTA

March 18-20	Pediatrics for General Physicians
March 21-23	Obstetrics for Specialists
April 6	Trauma for General Physicians
April 8-10	Radiology for General Physicians
April 11-13	Allergy and Chest Disease for General Physicians
May 6-10	Introduction to Electrocardiography for General Physicians
May 13-17	Proctology for General Physicians
May 23-25	Surgery for Surgeons

For further information concerning the above courses, write to the Director, Department of Continuation Medical Education, 1342 Mayo Memorial, University of Minnesota, Minneapolis 14, Minnesota.

STATE OPHTHALMOLOGISTS URGED TO AID FIREARMS SAFETY TRAINING PROGRAM

During the past year and a half the Minnesota Department of Conservation has been organizing and administering a statewide course of instruction in firearms safety to Minnesota youngsters between the ages of ten and sixteen.

This program, which was established during the 1955 session of the state legislature, requires the training of youths in this age group who wish to participate in shooting or hunting activities. The program is carried out on a local community basis through a volunteer corps of trained instructors and through contributed monies from civic groups, organizations and private concerns and through local training fees levied on the youngsters.

Mr. Lee Kuluvar, the state coordinator for the program, has informed the Minnesota State Medical Association that the state is trying to encourage visual checks for the youth trainees taking the instruction. In a study made on the vision of hunters and other shooters who had accidentally shot other individuals during 1953, it was found that the visual capacity of an individual has a definite bearing on firearms accidents. The most revealing fact was that the greater percentage of these "shooters" did not know of their handicap. Therefore, the state feels that to acquaint these individuals with their vision limitations could very well have a direct bearing on the accident rate.

As a noncompulsory part of the training program the students are being encouraged to have their eyes checked. Because it is a voluntary community project for the good of the youth and the citizens of the community, state medical association members who are ophthalmologists are being asked to cooperate in this project.

The visual checks are not too involved and should be made in the following areas: visual acuity, muscle balance, depth perception, color vision and field of vision. The youngster should then be informed whether or not his vision is or is not adequate in all areas, so that he can report this to his parents. It is hoped that the parent will take the necessary steps for correction of correctable deficiencies. If the deficiency cannot be corrected, the parents will at least know of the limitation.

For the past three autumns the state has also tried to encourage these free checks for the adult hunters. These programs are generally set up by some sponsoring organization and through the volunteer help of licensed examiners. This coming fall it is hoped that this community adult hunter checking program will become even more widespread. Any assistance on the adult program will also be greatly appreciated by the state firearms safety program.

Menopausal symptoms in 100 patients between the ages of thirty-five and sixty-two years were treated with 6 mg. daily of methallenestril (Vallestril), a synthetic estrogen; a contra-test group of twenty patients received a placebo. Good or fair results were obtained in 91 per cent of the test group in contrast to 15 per cent in the control patients.

The dosage schedule ran for thirty days, at which time medication was interrupted for two weeks and the need for a second course determined by the return or absence of symptoms. No patient was given more than three such courses in any four-month period.

Vaginal smears taken from certain patients objectively corroborated the subjective findings. An estrogenic response was evident after ten to fourteen days of medication and persisted for sixteen to thirty days after cessation of therapy.

The dosage used did not cause withdrawal bleeding or any other untoward effects but generally gave a feeling of well-being. As is usual with all estrogens, the warning against unnecessarily prolonged medication offered.—Goldfarb, A. F., and Napp, E. E.: J.A.M.A. 161:616 (June 16) 1956.

Woman's Auxiliary

MID-WINTER BOARD MEETING HELD JANUARY 23

The Midwinter Board meeting was held January 23, 1957, at the Minnesota Club, St. Paul, with forty-eight members present. Mrs. L. P. Howell presided. Mrs. Robert Flanders, president of the Woman's Auxiliary of the American Medical Association, was a guest at the meeting and spoke following the luncheon. Mrs. William Finkelburg, Winona, led the group in the pledge of loyalty to the Auxiliary. Mrs. E. R. Hudec called roll and read the minutes of the fall meeting; Mrs. W. B. Stromme read the treasurer's report. Mrs. J. M. Waugh, corresponding secretary, read letters from Mrs. P. J. Pankratz, who, with her husband, is now working at the Mennonite Mission in Taiwan, Formosa, and from Mrs. C. L. Oppegaard, president-elect, who was in Phoenix, Arizona, celebrating the advent of a new grandson. Following is a summary of the reports of officers and committee chairmen:

Mrs. Reuben Erickson, first vice-president, reported on the TB essay awards. The Auxiliary again co-sponsored the contest, and she presented the awards to the winners over WCCO-radio (Minneapolis) in December. She told of her activities on the geriatrics commission and urged Minneapolis women to become acquainted with the Council for Senior Citizens and its work with the aged people of Hennepin county.

Mrs. H. F. Polley, Rochester, described the regional meeting in Region One and Mrs. M. I. Hague, Clarkfield, reported on meetings in Region Three. Mrs. Hague stated that a full report of the fall school of instruction was given at a regional luncheon meeting, that she had spoken at a meeting of the Lyon-Lincoln Auxiliary, and that her county groups had difficulty filling out the blanks for the nominating committee.

Mrs. L. Raymond Scherer spoke on the problems of Region Six, which includes Hennepin county. She also gave a special, detailed, excellent report on Medicare, the program for dependents of military service personnel. These individuals are now receiving free diagnostic and in-hospital care from civilian physicians, with the state medical association as fiscal agent. She stressed the importance of the fact that this plan does allow for free choice of physician and the fact that doctors have their own societies as fiscal agents and their own grievance committees to handle complaints. Since Minnesota does not have a large military personnel, our administration problems will not be as great as elsewhere.

Mrs. Philip Arzt reported for Mrs. W. P. Gardner, state legislative chairman. She listed several bills of special interest to the medical profession which will be debated in the current Minnesota legislative session. These concern the status of Minnesota osteopaths, sanitary conditions and inspection methods in restaurants, salaries of Minnesota public health officials and a new

medical examiner system to augment the county coroner set-up. Mrs. Flanders talked about national legislation: the Medicare program, the Jenkins-Keogh plan to establish a retirement fund for the self-employed, the disability amendment to the social security act passed in the last session, the federal reinsurance program, and the Hill-Burton hospital construction program. Both she and Mrs. Arzt urged members to read the legislative material in *Bulletin*. Mrs. Howell asked that everyone read Dr. Dwight Murray's speech, "Freedom in Medical Practice," copies of which were distributed, as it presents a good over-all picture of the trends in medical practice in the United States. It underlines the basic principles which we must hold on to, not because of self-interest, but because of "what is best for all Americans and our free society."

Mrs. E. H. Soule, Allied Careers chairman, told of Red River Valley's decision to help a widow study anesthesiology. She said she had new material on careers which she will send out to the county auxiliaries. Mrs. C. E. Carlson, Alexandria, reported on a successful and unique Career Days program held in her city for high school students.

AMEF chairman, Mrs. W. E. Wellman, in a written report, urged 100 per cent participation of county groups and expressed gratification with the response to the fund drive this year. She suggested special projects such as silver teas and bake sales to raise money if treasuries are low. Deadline date is May 1. Mrs. Flanders encouraged members to use the "In Memoriam" cards for AMEF. Medical Education week could well present an opportunity to remind the public of the high standards of our medical schools and the increasing costs of medical education.

Mrs. Ralph Eckman spoke of the value of *Bulletin*. Mrs. John Cameron, Cancer chairman, asked that each county make good use of the cancer education kits provided for all the Auxiliaries. She was enthusiastic about the cancer society's workshop which she attended last fall. Civil Defense chairman, Mrs. J. A. Cosgriff, distributed various leaflets with good program material on defense. She reported on her attendance at a civil defense meeting in St. Paul where plans were made to appoint civilian disaster chairmen in schools. They would take over in case of emergency.

Mrs. C. E. Carlson, editor of the *Minnesota Gopher Doctor's Wife*, discussed the expense of publishing the newsletter and invited comments about it. All were enthusiastic about the development of the publication, its new format, its increased news content, its personal tone. Putting out a six-page issue of four issues a year would be desirable because of the wealth of material worthy of printing, but this is contingent upon costs. Mrs. Carlson thanked all members who have contributed items and ideas, asked for personal items of general

interest to our membership as well as stories about meetings and projects.

Health Days chairman, Mrs. Conrad Karleen, requests information about any health days that have been held or are planned.

Mental Health chairman, Mrs. William Gjerde, reminded members of 'mental health week in April and asked that each county auxiliary plan some type of activity for that week. She described "Milestones to Marriage," the series of pamphlets which has been sent to all auxiliaries for study with the hope that this valuable material can be used by high school students. She discussed ways of financing such an undertaking and listed the many organizations willing to help in the venture. Mrs. Francis McCarten, Stillwater, gave a special report on the emotionally disturbed children at the Hastings hospital, a moving story of what she herself had seen. She told of the volunteer work the Washington County Auxiliary has done for several years for the mentally ill in that institution. She encouraged members to do similar work wherever possible.

Mrs. A. B. Rosenfield, editor of our page in MINNESOTA MEDICINE, and Mrs. Leonard Arling, publicity chairman, both expressed thanks to all who have submitted material for their purposes. Mrs. L. R. Boies, printing chairman, announced that additional rosters are available at the state office and that the new constitutions will be printed soon. Mrs. Harold Wahlquist, who has worked on the revisions, discussed the editing of the constitution.

Program has received so much emphasis this year that Mrs. Arzt feels every group is aware of all phases of Auxiliary interest. She urged participation in the Science Fairs and asked for names of any new program chairmen who have been appointed. The Stearns-Benton idea of printing a year's program in advance was discussed. Mrs. Ezra Bridge, new president of Goodhue, stated that her society also makes long-range program plans and is now preparing a program booklet. Mrs. Howell said she felt programs need not always deal with Auxiliary work or medical matters but should always include something relating to Auxiliary interests—a series of announcements, a brief report of a meeting or a short talk.

Mrs. M. O. Wallace emphasized that everything doctors' wives do is really public relations work for their husbands: sponsoring TB contests, promoting career days, selling *Today's Health*—all these things. She stressed the fact that *Today's Health* is good PR material and that every doctor's wife should see to it that a copy is in her husband's office.

Mrs. Karl Anderson reported briefly on the fall school of instruction, the success and liveliness of the meeting and its good attendance. Mrs. H. P. VanCleve wants 100 per cent support from all counties for *Today's Health*. Minnesota's quota is 2,198. To date we have 524 subscriptions, well over last year at this time. This does not include subscriptions sent by the state medical association to all our legislators to acquaint them with the work done by the AMA in health education.

Nominating committee chairman, Mrs. Charles Merkert, thanked the counties for their cooperation in the work of her committee. The slate of officers will be read at the annual meeting.

In her president's report, Mrs. Howell cited the value of the interchange of ideas that a board meeting affords. She underlined the importance of securing a basic committee organization throughout the state and thinks there must be this committee structure if the county Auxiliaries are to function. She feels the basic "musts" are program, legislation, membership and *Today's Health*, and would like to add others! Such uniformity would result in a quickly mobilized, effective state Auxiliary. She regards as our greatest assets the fine support of the state medical association and our wealth of good leadership all over the state. Our greatest problem is the difficulty of relaying information from state board to general membership. "Black books" will be turned over to new chairmen and officers in May and Mrs. Howell asks that each include a copy of the year's report and suggestions for procedures.

Mrs. Karl Anderson described the activities of Hennepin auxiliary in establishing an Auxiliary for the wives of medical students at the University of Minnesota.

Mrs. Carlson reported on the new project, "Magazine for Friendship." She urged everyone to send at least one magazine a month abroad, to share our everyday information with people overseas. Mrs. Charles Froats, St. Paul, told of the success of a similar magazine project in another group to which she belongs.

Mrs. W. P. Ritchie announced the state convention dates: May 13, 14, 15, 1957. Place: St. Paul. Mrs. Howell announced that the national convention will be in New York, June 3-7, with headquarters at the Hotel Roosevelt. A block of rooms will be held for Auxiliary members until April 15. Mrs. Oppegaard will supply delegate cards at the annual state meeting.

Immediately after luncheon, Harold Brunn, assistant executive secretary of the state medical association, expressed his appreciation of the work of the Auxiliary and Dr. H. P. Sweetser, sixth district councilor, extended greetings from the Association. He spoke of the need for the Auxiliary and his gratitude for the many ways in which it helps the doctors. Mrs. Howell pointed out that Dr. Sweetser's mother was the first president of the state Auxiliary, serving three consecutive terms.

Mrs. Harold Wahlquist, past national president, won a round of applause when her outstanding contributions to our Auxiliary were listed by Mrs. Howell who had been writing a thumb-nail history of our group for *Bulletin* and found Mrs. Wahlquist responsible for much of our progress.

Featured speaker at the luncheon was Mrs. Robert Flanders, whose theme was: "Health Is Our Greatest Heritage." She cited Minnesota as one of the outstanding auxiliaries in the country, went on to explain how the Auxiliary, on a nation-wide basis, influences the health thoughts of the entire nation. She stresses that the Auxiliary must match steps with progress. Members must "be everywhere" to bring health education

to the public, be leaders in their communities in all health services to defend the nation against health ignorance. She believes it the duty of every doctor's wife to carry on this work. She said that the programs of the Auxiliary have proved their worth; the public respects and seeks the guidance of doctors' wives and the doctors' wives must not fail the doctors. She thinks it is up to the individual doctor's wife to study the health needs of her community; that health needs and tasks grow as technology advances are perfected. Each member should read *Bulletin* and *Today's Health* and work to increase membership for better service.

Mrs. Flanders believes education and service are the basic purposes of Auxiliary work. This coming year, she said, old projects will continue and new ones will be added, such as accident prevention—traffic safety in particular. Women should insist on safety devices on their cars and cooperate with safety organizations.

She stressed the great value of public relations. Every doctor's wife is doing PR work for her husband when she works on drives, in hospitals, in her church groups. She has a double role as a good wife and mother plus her role in health. The demands on a doctor's wife are many but so are the compensations for there is satisfaction in service to humanity.

EDITORIALLY SPEAKING

It would seem that the members of our society are just as resistant to the magazine *Today's Health* as they used to be toward *Hygeia*. In that day it was said this opposition was directed more against the editor, M. F., than any other factor, but he is long gone, the name, format and contents have been changed, and still there is a profound lack of interest in this fine propaganda medium.

It is agreed that we physicians have not been able to get our message across to the general public and their representatives in the federal and state legislatures. Well, maybe all do not agree with this statement, but the results would indicate that it is 99 44/100 per cent true. No longer can our officers and agents walk into a legislative committee and get the laws and actions that we request. Some yes, but many, no.

The individual physician is still well liked and respected by his patients, but physicians as a group are not liked by the man in the street, the voter. This has been confirmed by local and national polls too many times to be denied. And we are doing so little about it.

There are many reasons for this and complacency and lethargy are not the most important ones. Time is a factor, and strange as it may seem, there is a lack of knowledge as to the basic issues. Some physicians believe their job is just to practice medicine and take care of the sick. Some of these have gone so far as to state that they do not care too much about the economic and political atmosphere under which they have to work

as long as they can work. The latter may have no interest in any kind of propaganda medium, but most of the rest would if they thought there was something that would be effective.

Why is it that *Today's Health* has never been given the consideration it deserves as this agent? It is written for the laymen. It not only explains diseases and treatment in easily understood terms, but there is always something in every issue about the free and independent practice of medicine and its advantages to the general public and the health of the nation.

Some physicians have not wanted the magazine in their reception rooms because sometimes the opinions of the author disagree with his opinions and this leads to some patient-physician conflicts. Could be this is a valid consideration.

But let's think in terms of general public education. Where may we do the most good? One thinks at once of the youngsters of the nation, the future voters. How many have ever thought in terms of our schools? Teachers are very anxious to get the magazine because it is so valuable in teaching hygiene, public health and preventive medicine.

It would cost so little for each physician to buy one subscription for a school library, public, parochial, grade or high. Maybe two or three for the latter. If this were done, we would be getting our official health message across to all the kids who are going to grow up and have their own ideas, concepts and prejudices the rest of their lives. They are going to hear lots of adverse propaganda, be exposed to lots of reading matter that blasts us and engage in lots of talk about health and doctors.

If they know the answers, they could be a big help. If they don't, they are apt to believe all kinds of wild rumors and untruths.

How about it? Why not spend a couple of bucks to win some future friends?

G. WILSE ROBINSON, JR.

Although acceptance of specific therapy is a primary goal in the control of tuberculous disease, it is not the only one. In a broader sense modern medicine strives to return to society an individual free from organic disease, capable of assuming personal, family, and community responsibilities. A concept such as this implies that the individual will be physically able to work—that he will have been prepared for some vocation. Not every patient, of course, will need to acquire a new occupation. There are many, however, who never have had a vocation and will have to be trained in one compatible with physical status and aptitude.—SIDNEY H. DRESSLER, *Am. Rev. Tuberc.*, August, 1956.

While tuberculosis is obviously an organic disease, it is just as clearly a social disease, taking its greatest toll among low-income, unskilled laborers suffering from overcrowded housing and poor nutrition.—REMA LAPOUSE, M.D., *Am. J. Pub Health*, August, 1956.

Reprinted from the Jackson County, Missouri, Medical Society *Weekly Bulletin*.

In Memoriam

EDMUND WHITNEY ALGER

Dr. Edmund W. Alger, physician for Pillsbury Mills, Inc., for thirty-five years, died January 26, 1957. He was eighty years old.

Born in southeast Minneapolis, Dr. Alger graduated from the University of Minnesota Medical School in 1902 and practiced medicine for fifty-two years before his retirement.

He was a member of the Hennepin County Medical Society, the Minnesota State Medical Association and the American Medical Association. Dr. Alger also was a member of the staff of Fairview Hospital, Minneapolis.

He is survived by his wife, Isabel, and a son, Whitney, Monroe, Louisiana.

PETER BOYSEN

Dr. Peter Boysen, a physician at Pelican Rapids, Minnesota, for many years, died January 14, 1957. He was eighty years old.

Born in Denmark in 1876, Dr. Boysen received his medical education at the University of Pennsylvania and interned at Kensington Hospital in Philadelphia. He took postgraduate work at the University of Minnesota and began practicing medicine in Pelican Rapids in 1912. He served as president of the board of education for several years and was a member of the Park Region District and County Medical Society, the Minnesota State Medical Association and the American Medical Association. He had also served as Pelican Rapids health officer.

CARL N. HARRIS

Dr. Carl N. Harris, chief of staff of the Adams Clinic in Hibbing, Minnesota, died February 10, 1957. He was sixty-nine years old.

Born in Assumption, Illinois, Dr. Harris received his medical education at Rush Medical College, Chicago, and interned at Ancker Hospital, St. Paul. He joined the Adams Hospital staff in Nashwauk, Minnesota, in 1917, but left later that year to take postgraduate work at Bellevue Hospital, New York City.

He served in France as a captain in the U. S. Army Medical Corps during World War I.

Dr. Harris practiced medicine in Wilmot, South Dakota, from 1919 to 1923, and rejoined the Adams staff in Nashwauk in 1923. He opened clinic offices in Chisholm in 1927 and moved to Hibbing in 1928. He became chief of staff of the Adams Clinic in 1952 when Dr. Bertram Adams retired.

A former chief of staff of Hibbing General Hospital, Dr. Harris was also a past president of the Range Medical Society, a member of the Minnesota State Medical Association and the American Medical Association.

He served as Hibbing village health officer during a period in which the local health department received national recognition. He was also a past president of the Minnesota State Sanitary Association.

Dr. Harris' civic interests were many and varied. He was a 32nd degree Mason, a past master of the Iron Range Lodge of Perfection and a member of the Shrine. A member of the Kiwanis Club, he served as its president at one time. He also served as a commander of the American Legion, and was a member of the Veterans of Foreign Wars and the Chamber of Commerce. He belonged to the First Presbyterian Church.

Dr. Harris is survived by his widow, Doris; two daughters, Mrs. Andrew (Margaret) McNitt, Pittsburgh, and Mrs. Duke (Shirley) Durfee, Washington, Illinois; a son, Carl M., a student at Rochester Medical School, Rochester, New York; a sister, Miss Rose Harris, Chicago; and two grandchildren.

ZACHARIAH EUGENE HOUSE

Dr. Zachariah E. House, a resident of Cass Lake, Minnesota, for thirty-five years, died at his home in Burbank, California, January 14, 1957. He was eighty years old.

Born in Baltimore, Maryland, in August, 1876, Dr. House received his medical education at George Washington University, Washington, D. C. He also received a degree in dentistry.

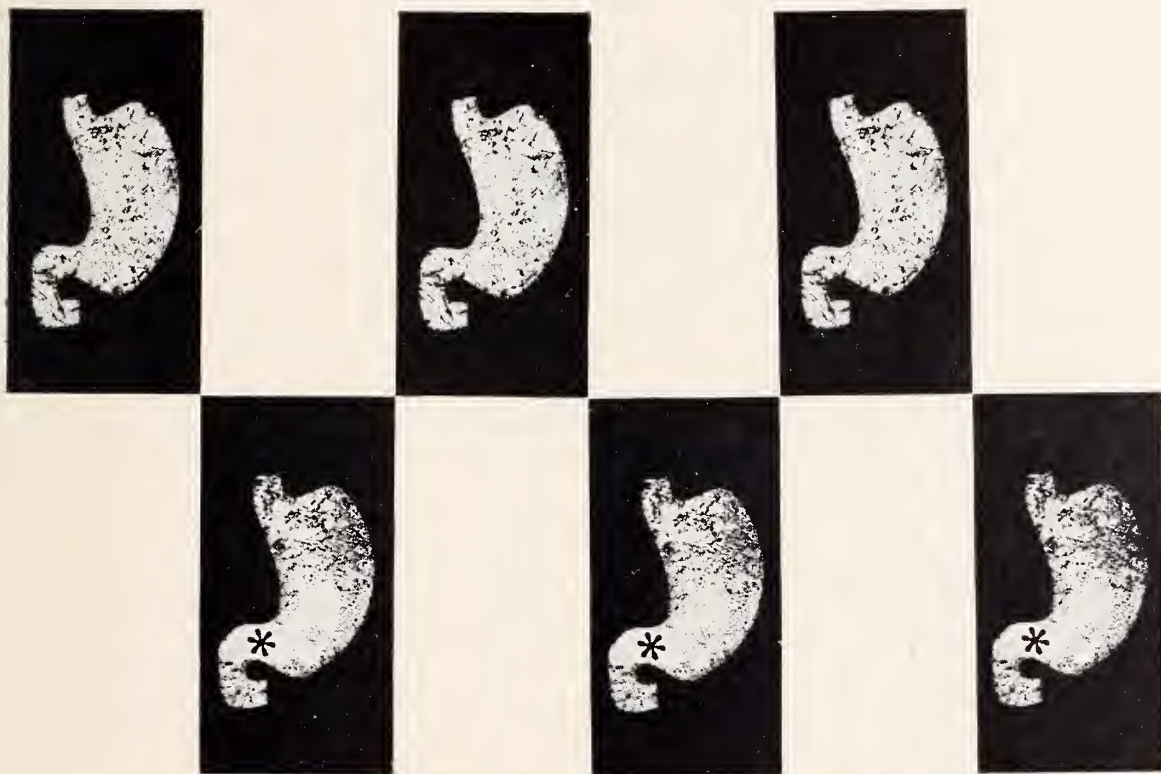
In 1910 Dr. House moved to Cass Lake, where he was employed as a physician for the Indian Bureau. He was twice mayor of the town as well as president of the board of education, president of the local golf club, the Booster Club and an active participant in church and other civic activities.

A major in the medical reserve of the United States Army, Dr. House was a member of the Upper Mississippi Medical Society, the Minnesota State Medical Association and the American Medical Association.

He is survived by his widow, Minnie; three daughters: Peggy, Burbank, California; Mrs. Bertram Donaldson, Jacksonville, Florida, and Mrs. Harold Lee, Grand Rapids, Minnesota; one son, James, Burbank, and a number of grandchildren and great-grandchildren.

Much has been written about the eradication of tuberculosis, and the fall in mortality and morbidity figures has given hope that it may be realized in the future. But to accomplish this desirable state of affairs, it is essential to find and control the chronic infectious cases. We cannot hope to get rid of tuberculosis until we do this for they are like the red-hot embers that remain after the main fires of a bonfire have died down and can set alight any nearby combustible material.—F. R. G. HEAF, M.D., *J. Royal Inst. Pub. Health and Hygiene*, Nov., 1955.

TRUE ANTICHOLINERGIC ACTION



Pro-Banthine® Inhibits Excess Parasympathetic Stimuli in Peptic Ulcer

Medical literature now contains more than 500 references to the beneficial role of Pro-Banthine Bromide (brand of propantheline bromide) and Banthine® Bromide (brand of methantheline bromide) as evidenced by a marked healing response of peptic ulcers. Rapid symptomatic improvement, particularly with reference to pain relief, is followed by roentgenographic demonstration of crater filling.

The therapeutic action of Pro-Banthine in

decreasing hypermotility and hyperacidity, together with the remarkable early subjective benefit, is a desired approach in the management of ulcers.

The initial suggested dosage is one tablet, 15 mg., with meals and two tablets at bedtime. An increased dosage may be necessary for severe manifestations and then two or more tablets four times a day may be indicated. G. D. Searle & Co., Chicago 80, Illinois, Research in the Service of Medicine.

SEARLE

THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

230 Lowry Medical Arts Building, Saint Paul 1, Minnesota

F. H. Magney, M.D., Secretary

CHASKA, MINNESOTA, MAN SENTENCED IN MINNEAPOLIS FOR BASIC SCIENCE VIOLATION

Re: State of Minnesota vs. Ralph E. Dixon

On January 7, 1957, Ralph E. Dixon, 49, Route No. 2, Chaska, Minnesota, was sentenced by the Hon. Theodore B. Knudson, Judge of the District Court of Hennepin County, to a term of one year in the Minneapolis Workhouse on a charge of practicing healing without a basic science certificate. Dixon had previously entered a plea of guilty to an information charging him with that offense on November 2, 1956. Judge Knudson ordered the execution of the sentence stayed, however, and placed the defendant on probation for a period of one year.

Dixon, who was selling vibrators manufactured by the Niagara Manufacturing and Distributing Corporation, Adamsville, Pennsylvania and recommending their use in the treatment of various diseases such as arthritis and bursitis, was arrested after an investigation into his activities had been conducted by the Federal Food and Drug Administration, the Minneapolis Police Department and the Minnesota State Board of Medical Examiners. The defendant was selling the vibrators, which were called the "thermo-cyclopad" and the "hand unit" in a Minneapolis department store. However, he also went to a prospective customer's home in order to demonstrate the machines. While Dixon was recommending the use of a "thermo-cyclopad" in the home of an agent of the Federal Food and Drug Administration for treating a stiff back, his sales talk was being recorded without his knowledge. The machine was then purchased for the sum of \$169.00. Subsequently, on October 24, 1956, a criminal complaint charging Dixon with violating the basic science law was signed by a representative of the Minnesota State Board of Medical Examiners and the defendant was taken into custody.

In a signed statement the defendant admitted that he had been recommending and selling these machines for use in the treatment of arthritis, and that he had stated that poor circulation and injuries frequently caused arthritis. He further admitted that he had represented that by the daily use of the "thermo-cyclopad," the calcium deposits in the body would be broken up and eventually the joints would be usable. The smaller machine, called the "hand unit," sold for the sum of \$74.50. Dixon, who holds no licence to practice any form of healing in the State of Minnesota, has no training in medicine and his experience has been mostly in sales work.

LICENSE OF SAINT PAUL PHYSICIAN REVOKED

Re: Revocation of the License of Roy C. Heron, M.D.

Following a hearing held on November 9, 1956, the Minnesota State Board of Medical Examiners revoked the medical license of Roy C. Heron, M.D., seventy-one, who maintained an office for the practice of medicine at 719 Hamline Avenue North, Saint Paul, Minnesota. Dr. Heron, a former deputy coroner of Ramsey County, had been charged in a citation issued by the Board on August 21, 1956, with aiding and abetting a criminal abortion upon a thirty-two-year-old Saint Paul divorcee. He was also charged with failing to keep case and history records on the various patients that he had attended professionally during the past ten years.

Although the citation had been previously served upon

Dr. Heron, he did not appear at the hearing to give evidence in his own behalf. However, evidence was submitted to the Board that Dr. Heron had packed the patient with gauze in April, 1956, in order to terminate her pregnancy and that he was paid the sum of \$200.00. When the patient later became ill and was hospitalized in a Saint Paul hospital, the matter came to the attention of the Minnesota State Board of Medical Examiners.

Dr. Heron, who was born in New Brunswick, Canada, in 1885, attended the Medical School of Hamline University in Saint Paul, where he was granted an M.D. degree in 1908. He was licensed to practice medicine in Minnesota in the same year.

ST. PAUL DENTIST SENTENCED TO EIGHT-YEAR PRISON TERM ON ABORTION CHARGE

Re: State of Minnesota vs. Earl S. Weber

On January 17, 1957, Earl S. Weber, sixty-one years of age, was sentenced by the Hon. Royden S. Dane, Judge of the District Court of Ramsey County, to serve a term of not to exceed eight years in the State Prison at Stillwater, Minnesota, following a plea of guilty by Weber on January 7, 1957, to an information charging him with the crime of abortion. The defendant had also entered a plea of guilty to a charge of having a prior conviction for a felony.

Weber, formerly a licensed dentist, who maintained an office at 311 Newton Building, St. Paul, was arrested on December 10, 1956, when it was learned that a thirty-one-year-old married woman who was suffering from the after-effects of an abortion had been hospitalized on the previous day at Ancker Hospital in St. Paul. The defendant in a signed statement admitted that he had agreed to perform the abortion when the woman first came to his office in the middle of November, 1956, but since she only paid him \$50.00 at that time he waited until November 30, 1956, when he was paid an additional \$50.00, at which time he performed the illegal operation by the use of a curette. Weber also admitted that he had issued a prescription for twelve tablets of penicillin for the patient.

Weber has a previous conviction for a felony, having entered a plea of guilty on January 27, 1949, in the District Court of Ramsey County to an information charging him with the crime of abortion. For that offense Weber was sentenced to a term of not to exceed four years in the State Prison, but the sentence was stayed and the defendant was placed on probation for four years. Weber's probationary period, however, was terminated on May 10, 1951, and within three months he became involved in another difficulty which resulted in his arrest. On August 10, 1951, Weber was sentenced by the Hon. Arthur A. Stewart, Judge of the District Court of Ramsey County, to pay a fine of \$500.00 or serve ninety days in the Ramsey County Jail following his plea of guilty to an information charging him with the crime of practicing healing without a basic science certificate, which is a gross misdemeanor. Weber paid the fine.

The investigation in that case disclosed that a twenty-five-year-old married woman had gone to Weber for the purpose of having an abortion performed. How-

(Continued on Page A-50)

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General Interest

At the annual meeting of the staff of St. Luke's Hospital, Duluth, on January 17, **Dr. Corrin H. Hodgson** of the Mayo Clinic was the principal speaker, presenting a medical travelogue entitled "Tsetse, Juju, and Tom-Toms," illustrated with motion pictures taken on a recent trip to Africa. **Dr. P. N. Bray**, obstetrician, became chief of staff of St. Luke's at that time, succeeding **Dr. Arden L. Abraham**.

* * *

Dr. Jack V. Wallinga, Minneapolis, has recently been appointed child psychiatry consultant to the Division of Child Welfare, of the Minnesota State Department of Public Welfare.

* * *

After two years' service in the U. S. Army Medical Corps at Fort Lee, Virginia, **Dr. J. C. Von Drasek** has returned to Mankato and reopened the practice which he began there in 1948.

* * *

The Detroit Lakes Clinic on February 1 moved into a new and modern building of thirty rooms on two levels. Members of the clinic who will enjoy the new facilities are **Drs. L. H. Rutledge, John B. Rutledge, C. W. Moberg, M. E. Odland, and E. W. Lorentzen**.

* * *

In late January **Dr. Malcolm A. McCannel**, Minneapolis, left for a two months' stay in Pakistan where he will serve on the staff of a free eye surgery clinic in Shikarpur. The forty-year old clinic, financed by the Church of England, specializes in the treatment and removal of cataracts.

* * *

Dr. Burton C. Sandberg, who has been associated with the East Range Clinic at Aurora for the past six months, left January 3 to join the U. S. Air Force. **Dr. Sandberg** is the first person born and raised in Aurora to enter the medical profession.

* * *

Four Mayo Clinic surgeons participated in the sectional meeting of the American College of Surgeons in New Orleans, February 4 to 7. **Dr. John L. Emmett** presented the diagnosis and treatment of adrenal tumors; **Dr. F. Henry Ellis** participated in the ophthalmology program; **Dr. James T. Priestly** talked on carcinoma of the stomach, and **Dr. John M. Waugh** outlined surgical procedures in treating peptic ulcers. In addition, **Dr. Priestly** was the principal speaker at a dinner meeting, February 3, preceding the sectional meeting.

* * *

At a recent meeting of the advisory board of St. Mary's Hospital, Minneapolis, **Dr. John P. Kelly** was elected chief of staff to succeed **Dr. James E. Trow**. **Dr. C. N. Borman** was elected vice chief of staff, and **Dr. N. J. Musty** was selected to serve as secretary-treasurer. Other members of the hospital advisory board include **Dr. Trow, Dr. Richard Neary and Dr. Robert E. Priest**.

Thirty members of the Rochester Dietetic Association heard an address on January 10 by **Dr. H. M. Odel** on "Acute Renal Insufficiency and Diet Relationship."

* * *

Dr. J. Earl Estes, of the section on vascular diseases of the Mayo Clinic, participated in a gerontologic symposium in Cincinnati, Ohio, in mid-January, presenting a paper on "Venous Disorders in Older People." In the same symposium, **Dr. Ancel Keys** of the University of Minnesota talked on "Calories and Cholesterol."

* * *

To point up the annual Heart Fund Campaign in Minnesota, the *Minneapolis Star* on January 28 carried a feature story on **Dr. Victor Lorber** of the University of Minnesota, a career investigator for the American Heart Association. He is one of three heart research investigators in the United States, and the AHA is the only group in the country underwriting scientists on such a lifetime basis. **Dr. Lorber's** work is fundamental research, in that he is trying to learn what makes the heart function.

* * *

Dr. George D. Haggard, Minneapolis, celebrated his 100th birthday at his home on January 18, 1957. Until the time of his retirement five years ago, **Dr. Haggard** was the oldest practicing physician in Minnesota.

* * *

Staff officers of St. Barnabas Hospital, Minneapolis, elected recently are: Chief of staff, **Dr. William T. Walsh**; vice chief, **Dr. Edgar A. Webb**; secretary-treasurer, **Dr. John T. Moehn**; chief of medicine, **Dr. John W. Johnson**; chief of surgery, **Dr. W. G. Schaefer**; chief of surgical specialties, **Dr. M. J. Stewart**; chief of pediatrics, **Dr. L. F. Erickson**; chief of obstetrics and gynecology, **Dr. M. T. Mitchell**; and head of the intern committee, **Dr. N. H. Lufkin**.

* * *

Dr. William R. Blomberg, who has previously built a clinic at Princeton, is building a new clinic at Snelling Avenue and Highway 36, to serve the community of Roseville. March 1 was set as the opening date for this new building which will accommodate three doctors and have laboratory and surgery facilities for emergency and accident cases.

* * *

The Minnesota Education Association recently presented its Distinguished Service School Board Award for 1956-57 to **Dr. Edward Q. Ertl** of Ellendale. In addition to his medical practice, **Dr. Ertl** has devoted himself to the cause of education in his community and the state for many years, and has served on the Ellendale board of education for thirty-six years.

* * *

A head-on collision on February 8 took the life of **Mrs. Cristjana Biering**, whose husband, a native of

(Continued on Page A-38)

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(Continued from Page A-36)

Iceland, is a medical fellow in pediatrics at University Hospitals, Minnesota. The Association extends its sympathy to Dr. Biering.

* * *

Dr. Merrill Chesler was the principal speaker at a meeting of the Minnesota Association of Plaintiffs Attorneys held at the Radisson Hotel, Minneapolis, November 30, 1956. His subject was "Reconstructive Surgery Following Trauma."

* * *

The annual meeting of the officers and board of members of the Mayo Association was held in Rochester on February 6, at which time all officers of the organization were re-elected. Medical members of the organization are: Dr. C. W. Mayo, chairman of the board of members; Dr. Waltman Walters, vice chairman; Dr. Samuel F. Haines, vice chairman; Drs. L. M. Randall and James T. Priestley, board members. Following luncheon, Dr. Frank J. Heck, chairman of two sections of medicine in the Clinic, spoke on "Current Developments in Medical Insurance," and Dr. Howard P. Rome, head of the Section of Psychiatry, outlined "The Place of Psychiatry in Modern Medicine."

* * *

Medical students submitting papers for the Schering Award, an annual competition among U. S. and Canadian medical students sponsored by the Schering Corporation, are showing a clear preference for the topic, "Recent Advances in the Biochemical Aspects and Treatment of Mental Disease." The papers dealing with this subject are almost double those submitted on cardiology and eye disorders, the other two subjects for the 1957 competition. The deadline for submission of manuscripts is June 30, 1957. The first prize in each of the three categories is \$1,000, and the second prize is \$500. Professionally useful gifts will be awarded for other outstanding papers. The contest is open to all medical students in the United States and Canada. Information may be obtained from the Schering Award Committee, 60 Orange Street, Bloomfield, New Jersey.

* * *

Dr. Edward Henderson, member of a section of orthopedic surgery at the Mayo Clinic, Rochester, and instructor in orthopedic surgery in the Mayo Foundation, Graduate School, University of Minnesota, has been awarded an exchange fellowship sponsored jointly by the American Orthopedic Association and the British Orthopaedic Association. One of four American and one Canadian orthopedic surgeons to be thus honored this year, Dr. Henderson will go to the British Isles in mid-April and spend seven weeks touring orthopedic centers in London, Oxford, Cambridge, Edinburgh, Glasgow and other cities.

* * *

As part of a symposium on "Living with Education," presented by the Women's College Board, composed of the alumnae clubs of twenty-nine member colleges, Dr. Adelaide M. Johnson, consulting psychiatrist and clinical professor of psychiatry at the University of Min-

nesota, spoke on "Education of a Woman to Meet Challenges and Conflicts" in Chicago, February 9.

* * *

The American Academy of Orthopedic Surgeons on January 28 awarded Dr. Leonard F. Peltier the Kappa Delta Award for research in orthopedic surgery. This annual award carries with it a prize of \$1,000. The research for this award was completed prior to Dr. Peltier's leaving for Kansas City, Kansas, where he is now Professor of Surgery and Head of the Section of Orthopedic Surgery at the University of Kansas Medical Center.

* * *

Dr. Edward A. Pasck, who has recently completed his residency in ophthalmology at Minneapolis General Hospital, has opened an office in Faribault.

* * *

Four Mayo Clinic staff members will participate in a series of "flying symposia" in the Far Pacific in April, under the sponsorship of the Bureau of Medicine and Surgery of the U. S. Navy. The four men—Drs. Winchel McK. Craig, Waltman Walters, John S. Lundy and James Eckman—will be part of a group of civilian specialists from medical centers in Chicago, Cleveland, St. Louis and Milwaukee who will take part in symposia presented at naval hospitals in Japan, the Marianas Islands, Guam, and at Tripler General Hospital, maintained by the Army, in Honolulu. Dr. Craig and Dr. Walters, who hold the grade of rear admiral in the U. S. Naval Reserve, will be assigned to active Naval duty for the duration of the trip; Drs. Lundy and Eckman will be consultants to the Bureau of Medicine and Surgery of the Navy during the period.

* * *

Dr. Leroy E. Burney, Surgeon General of the U. S. Public Health Service, has announced the recent appointment of Dr. Jerome T. Syverton, Minneapolis, to the National Advisory Allergy and Infectious Diseases Council. Dr. Syverton is head of the department of bacteriology and immunology at the University of Minnesota. As a council member, Dr. Syverton will assist in recommending and advising with respect to the grant activities of the National Institute of Allergy and Infectious Diseases, Bethesda, Maryland, which is one of seven institutes conducting research for the Public Health Service.

* * *

A Minnesota-born and trained physician, Dr. Thomas G. Petrick, has been named Pathologist and Director of the Laboratory at Good Samaritan Hospital in New York City. Dr. Petrick received his medical education at the University of Minnesota Medical School, and is a native of Eveleth, where his mother still resides.

* * *

On January 29, Dr. Otto W. Scholpp of Hutchinson enjoyed a combined celebration—his seventy-eighth birthday and his fiftieth anniversary as a physician. Dr. Scholpp has practiced in Hutchinson for forty-eight years, coming to that vicinity from Duluth.

* * *

Dr. Carl Simison, Barnesville, has succeeded Dr. J. F.

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Schneider of Moorhead as president of the medical staff at St. Ansgar Hospital, Moorhead. Dr. Arthur Burt, Fargo, was chosen vice president, and Dr. James W. Duncan, Moorhead, was named secretary-treasurer. In addition to Drs. Simison, Duncan, Burt, and Schneider, Drs. R. E. Kulland, West Fargo, and B. T. Bottolfson, Moorhead, will serve on the executive committee.

* * *

A physician and a psychiatrist have recently joined the staff of the Fergus Falls State Hospital. Dr. Ruta Jauniskis, a native of Lithuania, who has served as resident physician at Mounds Park Hospital, St. Paul, took over her duties as physician at the state institution on January 3. Dr. Richard Ahrens, who was associated with the Fergus Falls Hospital from 1938 to 1940, returned January 15 to take over his new duties as psychiatrist.

* * *

In a report prepared for the annual meeting of the American Society of Surgery of the Hand, Drs. Paul R. Lipscomb, Edward D. Henderson, and Earl C. Elkins of the Mayo Clinic described tendon transfer operations which have restored the use of hands and fingers resulting from paralysis from broken necks, describing nine such operations performed at the Clinic in the last two years.

* * *

Dr. E. H. Ryncarson of the Mayo Clinic spoke on family health at the annual banquet of the Minnesota Council of Painting and Decorating Contractors in Rochester in late January.

* * *

Dr. Irving C. Bernstein addressed a meeting of the North Dakota branch of the American Academy of General Practice in Fargo, December 8, 1956. His subject was "The Etiology and Management of Pruritus Vulvae."

* * *

Dr. John S. Lundy, founder of the Section of Anesthesiology at the Mayo Clinic and professor of anesthesiology in the Mayo Foundation Graduate School, University of Minnesota, is the subject of a two-page tribute, entitled "We Salute . . . John Silas Lundy, M.D., in the January-February issue of *Analgesia and Anesthesia*, official organ of the International Anesthesia Research Society.

Dr. Lundy introduced pentothal sodium for clinical practice in 1934, and was the first to use radioactive pentothal. He established the first blood bank in 1935, and the first postanesthesia recovery room in 1942. He organized the Anatomy Department of the Mayo Clinic and Mayo Foundation in 1927, and supervised it until 1947. He has written a textbook entitled "Clinical Anesthesia" and an almost endless number of papers, book reviews, editorials and abstracts. He established *Anesthesia Abstracts*, and has been editor of the Section on Pain of *The Journal-Lancet* since 1952.

* * *

The Upper Mississippi Medical Society met on January 19, 1957, in Brainerd, Minnesota. After the business session.

(Continued on Page A-42)



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(Continued from Page A-40)

ness meeting, the scientific program was presented by Drs. F. T. Becker, C. C. Brown, R. H. LaBree, J. P. Moyer and H. G. Moehring of the Duluth Clinic.

* * *

Dr. Richard Bardon of Duluth was re-elected president of the St. Louis County Historical Society for 1957.

* * *

Dr. Josiah Fuller presented a paper on forty-five cases of sub-phrenic abscess in Duluth, at the January meeting of the Duluth Surgical Society.

* * *

At the January meeting of St. Luke's Hospital Medical Staff in Duluth, Dr. T. J. Jensen presented a talk on his fifty years' experience in the practice of obstetrics. The most pleasing aspect of the whole talk was Doctor Jensen's gay and youthful manner as he reminisced.

* * *

Philip R. Allison, professor of surgery at Oxford University, England, delivered the twenty-fourth annual E. Starr Judd Lecture Thursday, February 21, at the University of Minnesota. His subject was "Some Problems of Dysphagia." The lectureship was endowed in 1933 by Dr. Judd, a 1902 University medical school graduate who later became a surgeon at the Mayo Clinic in Rochester.

* * *

The Red Wing, Minnesota, Hedin Memorial Fund group held its annual meeting in January. This fund was set up one year ago as a nonprofit charitable institution in memory of the late Dr. R. F. Hedin. Its purpose is to give aid to students with limited means who might otherwise be unable to attend institutions of higher education or vocational and trade schools.

* * *

Dr. L. W. Morsman and Dr. B. S. Adams, two veteran Hibbing physicians, were honored by the Hibbing Hospital Advisory Board at a meeting in January. The two men, in addition to the late Dr. F. W. Bullen, organized the Range Medical Association, which has grown from the original thirty-three to eighty-three members.

* * *

The annual dinner meeting of the Waseca County Medical Association and its auxiliary was held in January at the home of Dr. and Mrs. R. C. Hottinger, Janesville.


* * *

The Wright County Medical Society held its January meeting in Monticello. Hosts were Drs. William E. Hart, Frank E. Ellison and M. B. Smorstok. Dinner was served at the River Inn before the meeting which was held at the home of Dr. and Mrs. Hart. Dr. H. B. Sweetser, Minneapolis, spoke to the group.

* * *

Mr. Arthur M. Calvin, president of Minnesota Blue Cross, has been elected a member of the Royal Society of Health, London.


(Continued on Page A-44)




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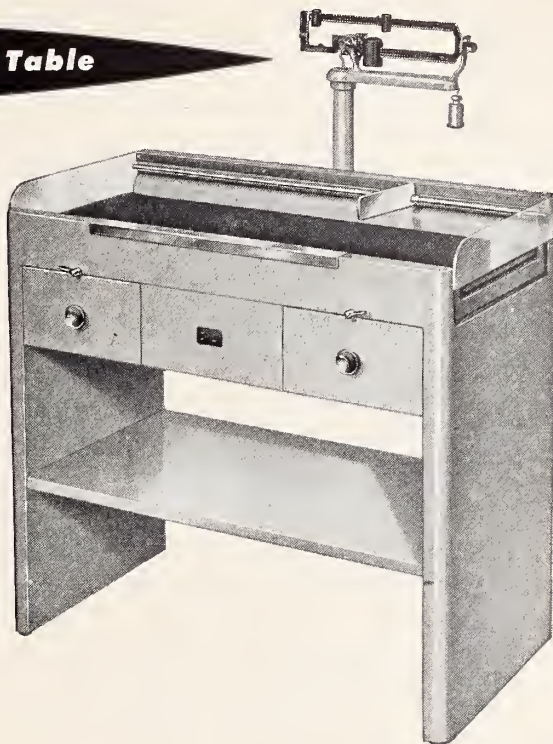


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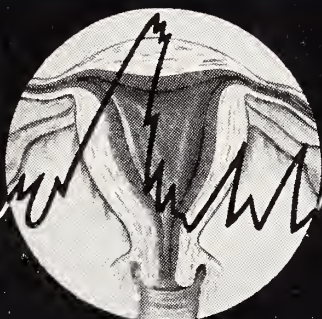
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(Continued from Page A-42)

Dr. Charles E. Rea, St. Paul, was chief speaker at meeting of the St. Joseph's Academy Parent-Faculty Club, January 21.

* * *

Dr. Harold F. Wahlquist, Minneapolis, has been appointed to the advisory board of the Minneapolis Society for the Blind.

* * *

The name of the late Dr. B. J. Branton, Willmar physician and surgeon for many years, will be memorialized in the refurnishing of two rooms at the Rice Hospital in Willmar. The project is sponsored by the Rice Hospital Auxiliary.

* * *

Dr. Sidney O. Hughes, Winona, has been elected 1957 president of the Winona County Medical Society; he succeeds Dr. W. O. Finkelnburg. Dr. R. B. Tweed was elected vice-president; Dr. L. J. Wilson, secretary and Dr. W. W. Haesley, treasurer. Dr. L. I. Younge was named delegate to the Minnesota State Medical Association and Dr. H. W. Satterlee, Lewiston, was named alternate delegate.

* * *

Dr. Mario Fisher, Duluth, spoke at a recent meeting of the Two Harbors Business and Professional Women's Club.

* * *

Dr. E. G. Hustad, Montevideo, is the new president of the Camp Release District Medical Society; Dr. Paul Schmidt, Granite Falls, is vice president, and Dr. O. M. Odland, Granite Falls, secretary-treasurer.

* * *

Miss Marion Murphy, professor of public health nursing at the University of Minnesota, has been named to a national advisory committee to assist in a new public health training program voted by Congress at its last session.

* * *

Dr. Leonard Arling, Minneapolis, spoke at a recent meeting of the Minnesota Alumnae Club.

* * *

Dr. Karl W. Anderson, Minneapolis, has been named vice-president of Northwestern National Life Insurance Company. He was formerly second vice-president and medical director.

* * *

The Renville-Redwood County Medical Society has organized the following committees for the coming year: *Medical Education and Hospitals*, Dr. Donald Metz, Buffalo Lake, chairman; Dr. Harvey Knoche, Morgan, Dr. Glenn Nelson, Fairfax and Dr. William Alcorn, Wabasso; *Medical Affairs and Ethics*, Dr. Chester Anderson, Hector, chairman; Dr. S. F. Cepelcha and Dr. A. W. Diessner, Redwood Falls, and Dr. John Dordal, Sacred Heart; *Diabetes*, Dr. D. G. Alton, Bird Island, and Dr. William H. Inglis, Redwood Falls, co-chairmen; *Medical Fees and Grievances*, Dr. J. A. Cosgriff, Jr., Olivia, chairman; Dr. Jack F. Haas, Fairfax, Dr. J. R. Lenz, Morton, and Dr. James B. Flinn,

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GENERAL INTEREST

edwood Falls; *Advisory Committee to Redwood County Welfare Board*, Dr. William Johnson, Morgan; Dr. Jonas Strauchler, Belview and Dr. A. W. Diessner, edwood Falls; *Advisory Committee to Renville County Welfare Board*, Dr. J. A. Cosgriff, Sr., and Dr. Daniel . Bessessen, Olivia, and Dr. H. P. Hinderaker, Bird land; *Board of Censors*, Dr. A. M. Fawcett and Dr. Robert Pierce, Renville, and Dr. R. E. Billings, Franklin.

* * *

Dr. Walter A. Fansler, Minneapolis, attended the Ohio Valley Proctologic Society meeting in Cincinnati, Ohio, in January. He presented a paper entitled "The Management of Abscesses and Fistulas With High Internal Openings."

* * *

Dr. Herman E. Drill, president of the Hennepin County Medical Society, has been appointed vice-chairman of the 1958 national meeting of the American Academy of General Practice to be held in Dallas, Texas.

* * *

Dr. Harold H. Joffe, Virginia, Minn., pathologist, spoke on "Autopsies" at a January meeting of the Virginia Rotary Club.

* * *

Dr. J. F. Traxler, Henderson, spoke on poliomyelitis at Henderson high school convocation in January.

Dr. George Boyer, Crookston city health officer, spoke at a recent meeting of the local Ken Study Club.

* * *

Dr. and Mrs. Edward G. Burleigh, formerly of Virginia, Minnesota, have moved to Minneapolis where Dr. Burleigh will complete a residency in anesthesiology. He had been a partner in the East Range Clinic.

* * *

Dr. Howard L. Horns, Minneapolis, has replaced Dr. Thomas Lowry, Minneapolis, on the Glen Lake Sanatorium commission.

* * *

Dr. J. Earl Estes, Rochester, presented a paper entitled "Venous Disorders in Older People" at the Gerontological Symposium held in Cincinnati in January.

* * *

Dr. M. D. Starekow, Thief River Falls, spoke at a recent meeting of the local Northwestern Hospital Auxiliary.

* * *

Dr. Richard M. Hewitt, Rochester, has written a new 388-page book entitled "The Physician-Writer's Book," which was published in January by the W. B. Saunders Company, Philadelphia. It is concerned with the "tricks of the trade of medical writing."

* * *

Dr. Philip Arzt, St. Paul, psychiatrist, spoke on



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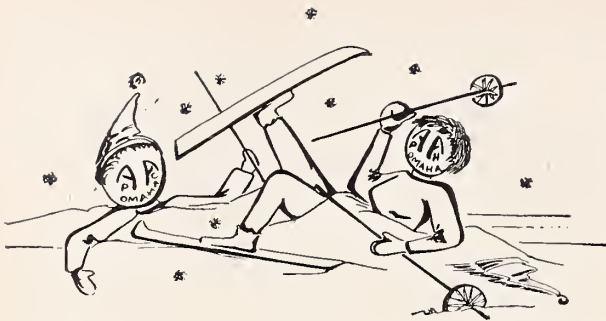
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"Psychiatry in Everyday Living" at a bank women forum in St. Paul, February 7.

* * *

Dr. William E. Proffitt, Minneapolis, was photographed by members of the Minnesota press as he administered a Salk vaccine shot to Governor and Mrs. Orville Freeman in January.

* * *

Dr. Leo G. Rigler, Minneapolis, spoke on "The Detection of Disease in its Incipency" at the 19th annual Clinic Day of Mount Carmel Mercy Hospital in Detroit, Mich., January 30.

* * *

Dr. H. Mead Cavert has been named assistant dean of the University of Minnesota medical school to succeed Dr. William F. Maloney who resigned to become dean of the College of Virginia Medical School.

* * *

Dr. John H. Moe has been appointed clinical professor and director, division of orthopedic surgery, University of Minnesota medical school. He was formerly assistant clinical professor of surgery.

* * *

Dr. P. J. Parker and Dr. J. E. Nord, Hallock, plan to set up practices in Staples, Minnesota, this spring.

* * *

Dr. Jack R. Pierce, a staff member of the Lenont Peterson Clinic in Virginia, has left with his family for Pikesville, Kentucky, where he has accepted a position with the United Mine Workers' Hospital.

* * *

Dr. Hershel Cope has completed a residency in obstetrics and gynecology at St. Joseph's Hospital, St. Paul, and has returned to his post with the Lenont Peterson Clinic, Virginia.

* * *

Physicians and attorneys discussed mutual problems at a meeting in Grand Rapids, Minnesota, recently. Four physicians and four attorneys formed a panel to discuss these problems. The physicians were Dr. M. J. Schirber, Dr. John Evensta, Dr. O. C. Braun and Dr. M. J. McKenna, all of Grand Rapids.

* * *

Dr. C. B. McKaig, Pine Island, recently celebrated the start of his 51st year as a physician.

* * *

Dr. Norman W. Hoover, formerly associated with the East Range Clinic, Virginia, has begun a residency in orthopedic surgery at the Mayo Clinic.

* * *

Dr. Myron J. Woltjen, Rushford, has entered military service; in his absence Dr. Hilmar R. Schmidt, formerly of Winona, and Dr. Warren W. Haesley, Winona, will be located in Rushford. Dr. Schmidt has moved to Rushford and Dr. Haesley will hold office hours there five mornings each week.

* * *

Dr. J. L. Mills, is observing his 35th year of practicing medicine in Winnebago. He and his present partner, Dr. D. E. Halverson, are moving into a new office building this month.

Gordon R. Kanman, M.D., and Charles Murnane, L.B., spoke at a joint meeting of the Tri-County Medical Society and the local attorneys at Willmar on Thursday, February 14. Their subject was "Medical-legal Relationships."

* * *

Dr. Nicholas Mensheha, Forest Lake, appeared on the television quiz show "Strike It Rich" to raise funds for the thirty-bed hospital planned for his community. Dr. Mensheha, a native of Kiev, fled from the Russian Ukraine with his infant daughter after the death of his wife.

* * *

Dr. Fred A. Rice has been elected chief-of-staff of Doctors' Memorial Hospital, Minneapolis. He succeeds Dr. Alan Blake. Other officers named include Dr. Lewis O. Zahrendt, assistant chief of staff, and Dr. Malcolm McCampbell, secretary-treasurer.

* * *

Dr. Dale Cameron, medical director, Minnesota Department of Public Welfare, spoke on mental illness at the recent Industrial Relations Center Labor Conference sponsored by the University of Minnesota.

* * *

Dr. William C. Menninger, general secretary of the Menninger Foundation, Topeka, Kan., addressed the annual dinner of the Minnesota Association for Mental Health, January 30. He also spoke before both houses of the Minnesota legislature.

* * *

Dr. Paul Dudley White, noted heart specialist, spoke at the kick-off breakfast of the Heart Fund campaign in Minneapolis, February 4.

* * *

Dr. A. F. Risser, Stewartville, has been elected chief of staff of the Olmsted Community Hospital, Rochester. He succeeds Dr. John E. Verby, Rochester. Other new officers are Dr. N. J. O'Keefe, Spring Valley, vice-president, and Dr. John R. Watson, Rochester, secretary-treasurer.

* * *

Drs. Mark Coventry, Lyle Weed, Robert Kierland and Paul R. Lipscomb, Rochester, spoke at a recent meeting in Chicago. This meeting was held to consider medical problems affecting the hands.

* * *

Dr. Lawrence D. Amick, who has completed a three-year fellowship in physical medicine in the Mayo Foundation, Graduate School, University of Minnesota, at Rochester, has been awarded a research fellowship from the National Foundation for Infantile Paralysis, of New York. The fellowship will allow Dr. Amick to continue his graduate work in clinical electromyography in London, England. He had done extensive graduate work in this field while he was a fellow of the Mayo Foundation.

* * *

Drs. E. H. Soule, M. B. Coventry, E. D. Henderson, P. R. Lipscomb, R. K. Ghormley, J. M. Janes, P. J. Kelly, H. H. Young and W. H. Bickel took part in the recent meeting of the American Academy of Orthopedic Surgery held in Chicago. All are from Rochester.

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Dr. Waltman Walters, Rochester, was moderator of a panel discussion on "Surgery of the Biliary Tract and Pancreas" at the January meeting of the American College of Surgeons held in Chicago.

* * *

Dr. Victor Johnson, Rochester, director of the Mayo Foundation for Medical Education and Research, presided over a session of the 53rd Annual Congress on Medical Education and Licensure held in Chicago, February 9-11.

Variations and loss of sensitivity to tuberculin have been observed in the course of some diseases. These changes are usually of a transitory nature, and tuberculin hypersensitivity returns with the improvement or recovery of the patient. The tuberculin reaction which may be slight or absent in those suffering from far advanced tuberculosis or tuberculous meningitis may return in those whose condition improves under antimicrobial treatment.—JOSEPH D. ARONSON, HELEN C. TAYLOR, DANIEL L. KIRK, *Am. Rev. Tuberc.*, July, 1956.

MARCH SCHEDULE, "DOCTOR, TELL ME"

Station	City	Day	Hour
KATE.....	Albert Lea.....	Wednesday.....	7:00 p.m.
KXRA.....	Alexandria.....	Thursday.....	7:00 p.m.
KBUN.....	Bemidji.....	Sunday.....	8:15 p.m.
KLIZ.....	Brainerd.....	Saturday.....	3:45 p.m.
KROX.....	Crookston.....	Saturday.....	9:30 a.m.
KDLM.....	Detroit Lakes.....	Sunday.....	4:15 p.m.
KDAL.....	Duluth.....	Sunday.....	9:05 p.m.
KOZY.....	Grand Rapids.....	Saturday.....	6:30 p.m.
KYSM.....	Mankato.....	Friday.....	9:45 p.m.
KMHL.....	Marshall.....	Sunday.....	5:00 p.m.
KUOM.....	Minneapolis.....	Monday.....	11:15 a.m.
St. Paul			
KCUE.....	Red Wing.....	Sunday.....	7:15 p.m.
KROC.....	Rochester.....	Sunday.....	10:15 a.m.
KFAM.....	St. Cloud.....	Saturday.....	9:30 a.m.
WAVM.....	Stillwater.....	Sunday.....	4:30 p.m.
KWLM.....	Willmar.....	Sunday.....	5:30 p.m.
KWNO.....	Winona.....	Wednesday.....	7:00 p.m.
KWOA.....	Worthington.....	Sunday.....	4:30 p.m.

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Both the amount Minnesota Blue Shield paid doctors for care of subscribers during 1956, and the number of physicians' services involved in the total amount paid were over 20 per cent greater than during 1955. This 10 per cent increase in payment and services cannot be accounted for solely by the increased number of subscribers enrolled which amounted to an increase of 13 per cent of the year of 1956.

Blue Shield provided benefits of \$6,919,348 during 1956 for physicians' services to participant subscribers. This figure is equal to average monthly payments of \$576,612, and is \$1,183,182 greater than the total amount paid by Blue Shield for physicians' services to subscribers during 1955, which amount was \$5,736,166.

The number of physicians' services to subscribers for which Blue Shield provided benefits during 1956 was 150,600, exceeding by more than 50,000, or approximately 25 per cent, the number of doctors' services for which Blue Shield provided payments during 1955.

The increase in total Blue Shield payments during 1956 over 1955, and the increased number of physicians' services for which Blue Shield provided benefits reflect not only the increased number of participant subscribers, but also greater utilization and improvements of Blue Shield coverage.

Addressing the annual members meeting of Minnesota Blue Cross held Thursday, February 21, 1957, in St. Paul, Arthur M. Calvin, president, announced that of a total of \$25,000,000 received from subscribers in 1956, hospital benefits paid to subscribers totaled \$23,501,546. This was the highest amount paid to Minnesota Blue Cross subscribers in the history of the organization. The \$23,501,546 figure represents 93.1 per cent of total subscriber income for the year 1956.

Commenting on the statement of conditions, Calvin pointed out that Blue Cross also had the lowest operating costs of the organization's history . . . 5.2 per cent.

Calvin explained that during the twenty-three years of the existence of Minnesota Blue Cross over \$146,000,000 has been paid to members in the form of hospital benefits. Commenting on this total figure, Calvin pointed out that in addition to the increased number of persons using hospital facilities compared with past years, people are also faced with the problem of increased hospital costs. "However, none of us would care to go back to the old days when many of today's scientific medical-surgical techniques were unheard of," Calvin explained.

Calvin, who is also a governor of the newly created Blue Cross Association, announced to the members that Dr. Basil C. McLean had accepted the presidency of that organization. Dr. McLean resigned his position as New York Commissioner of Hospitals to accept the new post. The new Blue Cross Association was formed to service the needs of the nation-wide employer.

Commenting on the relationship of Blue Cross and the American Hospital Association, Calvin paid tribute to the officers and staff of that organization for their assistance in developing a cost basis for payment to hospitals by third party organizations; in government




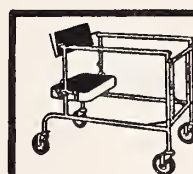
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relations at the national and local level, in endeavoring to provide health care to a greater number of people without imposing a compulsory national health system in the United States.

Calvin concluded by saying: "The philosophy of Blue Cross is as basically sound today as it was 23 years ago when seven hospitals initiated the program. The people of Minnesota are in need of the services of an organization such as Blue Cross today, as they were during the depression days."

Richard T. Crist, Vice President in charge of internal operations, told members that, during 1956, accident cases among Blue Cross members showed a marked increase. During 1956, Blue Cross benefits were provided for 30,069 accident cases, compared to 25,524 cases during the previous year. This increase represented approximately \$500,000 in hospital expenses over 1955.

Donald J. Condon, Vice President in charge of enrollment and public relations, announced that 1,106,134 participants are now enrolled in Blue Cross. This figure represented an eight per cent gain over 1955 . . . a record year.

ST. PAUL DENTIST SENTENCED TO PRISON TERM

(Continued from Page A-34)

ever, Weber denied that he intended to perform an abortion but admitted that he had made a vaginal examination of the patient, advised the patient she was pregnant and inserted "about twelve inches of gauze in her vagina." The defendant was paid \$50.00 by the patient for his services in that case. Weber, who was born in Louisiana on January 26, 1896, is a graduate of the Dental School of the University of Minnesota in 1921. On January 11, 1957, the Minnesota State Board of Dental Examiners revoked Weber's license to practice dentistry.

There is perhaps no infectious disease in which the etiologic role of environment is more important than in tuberculosis. There can of course be no tuberculosis without the tubercle bacillus, but aside from a part in determining the opportunities for contact between the sick and the healthy, environment has a continuing and vital influence upon the severity, course and fatality of the disease.—ALTON S. POPE, M.D., and JOHN E. GORDON, M.D., *Am. J. Med. Sciences*, September, 1955.

* * *

It is certain that there are millions of individuals in the United States today, possibly 50 million, who are infected with tubercle bacilli. ROBERT J. ANDERSON, M.D., *Pub. Health Rep.*, February, 1956.

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Book Reviews

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED

SURGERY IN WORLD WAR II. Orthopedic Surgery in the European Theater of Operations. Colonel John Boyd Coates, Jr., MC., Editor-in-chief; Mather Cleveland, M.D., Editor for Orthopedic Surgery; Elizabeth M. McFetridge, M.A., Associate Editor. 397 pages. Illus. Price 4.00, cloth. Washington, D.C.: U. S. Printing Office, 1956.

SURGERY IN WORLD WAR II. Volume II. General Surgery. Colonel John Boyd Coates, Jr., MC., Editor-in-chief; Michael E. De Bakey, M.D., Editor for General Surgery; W. Philip Giddings, M.D., and Elizabeth M. McFetridge, M.A., Associate Editors. 417 pages. Illus. Price \$4.25, cloth. Washington, D. C.: U. S. Printing Office, 1955.

GENERAL UROLOGY. Donald R. Smith, M.D., Clinical Professor of Urology and Chairman of the Department of Urology, University of California School of Medicine, San Francisco. Consulting Urologist, San Francisco Hospital; Consulting Surgeon (Urology) Veterans Hospital, San Francisco; Chief of the Department of Urology, St. Luke's Hospital, San Francisco. 328 pages. Illus. Price \$4.50, paper cover. Los Altos, California: Lange Medical Publications, 1957.

CLINICAL ROENTGENOLOGY, VOLUME IV, THE DIGESTIVE TRACT, THE GALLBLADDER, LIVER AND PANCREAS, THE EXCRETORY TRACT. By Alfred A. DeLorimier, M.D., Radiologist St. Francis Memorial Hospital, San Francisco, California; Harry G. Moehring, M.D., Radiologist, Duluth Clinic, Duluth, Minnesota; and John R. Hannan, M.D., Radiologist, Cleveland, Ohio. Cloth bound, \$24.50, 676 pages, 1112 illustrations. Springfield, Illinois: Charles C Thomas, 1956.

In this volume the authors present the roentgen approach for study of the alimentary tract, and the genitourinary tract. The presentation is thorough and yet is concisely written. The authors attempt to integrate the x-ray manifestations with the clinical picture.

Each organ, condition or disease is considered separately and divided into the logical subdivisions of general considerations, roentgen manifestations, clinical correlation, laboratory corroboration, and differential considerations. The bibliographies are adequate. The physical characteristics of the book are exceptionally good. It is clearly printed and a double column form makes for easy reading. The roentgenogram reproductions are good.

Radiologists will find this volume of particular value, but it is a good reference for all clinicians.

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ASSISTANT WANTED—in very active general practice in Central Minnesota. New, excellent hospital in town. New Clinic building. Good hunting and fishing. Address E-566, care MINNESOTA MEDICINE.

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WANTED—General practitioner with some special training in internal medicine or one desiring to develop in that field while associated with a clinic group.—Address E-568, care MINNESOTA MEDICINE.

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The Minnesota State Medical Association maintains a Medical Placement Service for the benefit of physicians who are looking for locations and positions; also for communities, medical groups and physicians who are looking for licensed medical assistance. For information, write to the Minnesota State Medical Association, 496 Lowry Medical Arts Bldg., Saint Paul 2, Minnesota.

MIDWESTERN GROUP OF SPECIALISTS wishes to employ young doctor interested in one- two- or three- year appointment as assistant in surgery. Industrial and emergency cases. Address E-565, care MINNESOTA MEDICINE.

WANTED—One or two young general practitioners to join busy general practitioner in small rural town with excellent clinic and hospital facilities. New 20-bed hospital one block from clinic. Financial arrangements open. Address E-567, care MINNESOTA MEDICINE.

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REGISTERED NURSES—Immediate openings. Starting salary \$240 month with opportunity for advancement. Room, board and laundry, annual vacation, liberal sick leave, 40-hour, 5-day week. Apply Personnel Office, Mental Health Institute, Independence, Iowa.

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Sulfonamide and Antibiotic Therapy —After Twenty Years

WESLEY W. SPINK, M.D.
Minneapolis, Minnesota

AFTER receiving my medical training elsewhere, I began my academic career at the University of Minnesota Medical School and Hospitals on August 1, 1937. I cite this personal note in introducing this subject because of the significance of the date. I had my clinical apprenticeship relative to the infectious diseases prior to the sulfonamide-antibiotic era, and I arrived at Minnesota with prontosil and sulfanilamide. For the last twenty years, all but one spent at Minnesota, I have had the opportunity with my colleagues of evaluating many drugs employed in the management and treatment of infectious diseases. Before plunging into a recital of the impact of these new forms of chemotherapy upon infectious diseases, I cannot resist referring to another personal aspect of my first days here at Minnesota. Late in the fall of 1939, Dr. E. T. Bell asked me if I would participate in a series of public lectures sponsored by the Minnesota Chapter of the Society of Sigma Xi, and suggested that I speak on chemotherapy. I took as my subject, "Sulfanilamide and Related Chemicals in the Treatment of Infectious Disease." On the night of February 2, 1940, I reviewed our clinical experience of two years at the University Hospitals with these new agents. I concluded my remarks by stating that we were working in a rapidly developing field. Sulfanilamide had been succeeded by sulfapyridine, and at that time we were engaged in studying a new compound, sulfathiazole! Incidentally, that lecture was published in the *Sigma Xi Quarterly*¹, and it was the germination of a subsequent monograph that I prepared on the subject².

From the Department of Medicine, University of Minnesota Hospitals and Medical School, Minneapolis.

Presented before the Minnesota Pathological Society, January 15, 1957.

Historical Highlights

Although Domagk possessed decisive experimental proof as early as 1932 that the red dye, prontosil, protected animals against lethal streptococcal disease, his report did not appear until 1935. But in the intervening three years there were rumblings in the German literature indicating that human streptococcal illness also responded favorably. Of the utmost significance in the development of this new form of chemotherapy were the observations of the French investigators, which revealed that the *in vivo* antibacterial action of prontosil was due to the liberation of para-amino-benzene-sulfonamide (sulfanilamide) by the host's tissues. From then on a rapid succession of sulfonamide compounds were studied and many adopted for use in human illness. The first report in America was by Long and Bliss³ in 1936, and at this time Dr. Chester Keefer and I started investigations on the use of prontosil and sulfanilamide in streptococcal and gonococcal infections.

Although the fundamental observations of Fleming⁴ on penicillin were published in 1929, it was not until 1941 that this antibiotic was administered parenterally to man. Just prior to the successful application of penicillin to diseases of man, Dubos⁵ announced his brilliantly conceived studies with tyrothricine. Unfortunately, the constituents of this antibiotic, gramicidin and tyrocidine, were too toxic to be administered systemically. The first recipient of penicillin at the University Hospitals was a seven-year-old girl, critically ill with acute staphylococcal bacteremia and osteomyelitis. The temperature was 105° F. and pulse 156. She was disoriented, and sixty-eight colonies of staphylococci per ml. of blood were present. The initial dose was given on June 11, 1942. The results were so dramatic, and the doses of penicillin,

all given intravenously, were so small, that the treatment is detailed as follows: 10,000 Oxford units every 4 hours x 4; 5000 units every 4 hours x 32; 2500 units every 4 hours x 20. The total dose was 252,500 units given over a period of fifteen days.

Waksman and his associates³ announced the isolation of streptomycin in 1944, and clinical trials with the "broad-spectrum" antibiotics occurred in 1948. Our initial experience with chlor-tetracycline (aureomycin) was in 1948, during a cooperative study on the therapy of brucellosis at the Mexico General Hospital in Mexico City.⁷ Chloramphenicol and the tetracycline drugs have been succeeded, but not displaced, by other antibiotics. There is no doubt that a highly competitive pharmaceutical industry will bring forth additional antibacterial agents in the future.

Accomplishments

Time does not permit a detailed survey of the remarkable advancements that have taken place in the management of infectious diseases during the past twenty years. Therefore, only a cursory inventory will be made of some of the accomplishments.

Streptococcal Disease.—Infections caused by Group A hemolytic streptococci have always been greatly feared, not only because of the suppurative complications, but also because of the late non-suppurative conditions, such as acute rheumatic fever and glomerulonephritis. It soon became apparent that prontosil and sulfanilamide were highly effective agents for hemolytic streptococcal infections. Otitis media, mastoiditis, sinusitis, meningitis, bacteremia, puerperal sepsis, erysipelas—all responded favorably to treatment. It is to be recalled, however, that within five years after the introduction of sulfanilamide and its derivatives, strains of hemolytic streptococci that were highly resistant to the sulfonamides were encountered with increasing frequency. At the time of this development the country was at war, and a major medical catastrophe would have occurred in our military personnel because of these resistant streptococci, if penicillin had not become available. Today, erysipelas is a medical curiosity in our hospitals. Streptococcal mastoiditis is a rarity, and fatal streptococcal septicemia is uncommon. It is generally believed that the incidence of rheumatic fever can be considerably reduced by the

prompt and proper prophylactic and therapeutic use of penicillin.

The most feared complication induced by the less invasive strains of streptococci, such as *Streptococcus viridans*, is subacute bacterial endocarditis. Prior to the advent of penicillin this disease was usually fatal, while today, at least 80 per cent of the patients recover after proper therapy.

Pneumococcal Disease.—The pursuit of satisfactory antipneumococcal agents was difficult and frustrating. Just prior to the sulfonamide era, type-specific antipneumococcal sera proved quite effective for lobar pneumonia. Although hemolytic streptococcal disease tumbled before sulfanilamide, this agent was not effective in pneumococcal pneumonia. But sulfapyridine and other sulfonamides proved to be highly acceptable, and serotherapy was discontinued. Pneumococci cause over 90 per cent of all bacterial pneumonias, and penicillin has reduced the mortality rate to such an extent that Gannon⁸ has stated, "Our residents and medical students now learn about the pathologic aspects of lobar pneumonia only from books, from the reminiscences of older clinicians and pathologists and from museum specimens." Even the complications of pneumococci pneumonia, such as empyema, are seen uncommonly.

Venereal Diseases.—Any physician who attended the genito-urinary clinic of a large municipal hospital before the arrival of the sulfonamides can appreciate the almost unbelievable impact that the sulfonamides and penicillin have had upon the incidence of gonorrhea. Fruitless, and at times harmful, washes and massages in the male have given away to the extremely effective drug, penicillin. According to Dr. H. G. Irvine of the Minnesota Department of Health, there were 3,873 reported cases of gonorrhea in Minnesota in 1935. Although the number of cases has been considerably reduced, and the complications have been largely eliminated, there were still 1,000 cases of gonorrhea reported in 1955. We are mindful that what happened with the streptococcus was also true of the gonococcus. After a few years, strains of sulfonamide-resistant gonococci appeared, which often rendered treatment ineffective. Fortunately, penicillin became available. Another exciting accomplishment has been the virtual disappearance of that most painful and

disabling complication of gonorrhea, gonococcal arthritis, from our hospital population today. The distressing gonococcal complication of infants, ophthalmia neonatorum, which often led to blindness, has been almost completely eradicated.

The sulfonamides proved to be ineffective in the control and management of syphilis, but penicillin therapy has accomplished essentially what has happened with gonococcal infections. According to Irvine there were 181 cases of primary and secondary syphilis reported for 1940 in Minnesota, whereas in 1955 there were only twenty-two cases. In addition, in 1940 there were 113 cases of congenital syphilis. During the years 1950-1955, inclusive, there were only six cases of congenital syphilis reported, and only three infected babies were born in Minnesota. The large number of cases of congenital syphilis reported in 1940 was partly due to the screening of individuals for Selective Service. Bell⁹ has commented upon the fact that congenital syphilis has virtually disappeared from the community.

Bacterial Meningitis.—Acute suppurative meningitis of bacterial origin has responded, often dramatically, to sulfonamide therapy since the earliest days. Hemolytic streptococcal meningitis was a common complication of otitis media, mastoiditis, and sinusitis, with a mortality rate approaching 90 per cent. Today, this form of meningitis is a rarity, and fatalities are extremely rare. I have not even seen a case of streptococcal meningitis within the past ten years. The terror of epidemic meningococcal meningitis has long subsided, and even with the sporadic case, early diagnosis and treatment result in prompt recovery. Even if an epidemic of meningococcal meningitis should threaten the security of a closed population, the danger can be eliminated overnight by administering sulfonamide to all the individuals. Although many effective antibiotics are now available, sulfadiazine is still the drug of choice for meningococcal meningitis. A biologic phenomenon of considerable interest is the fact that the gonococcus is very closely related to the meningococcus; and while strains of sulfonamide-resistant gonococci have appeared, similar resistant strains of meningococci have not posed a clinical problem. The most common form of bacterial meningitis in infancy and early childhood is that due to type B *Hemophilus influenzae*. Influenzal meningitis still occurs only too frequently, carrying

with it a mortality rate in the untreated cases of around 90 per cent, and even in those patients treated properly, serious brain damage may ensue. Although respiratory infections of pneumococcal origin respond very favorably to penicillin and to other antibiotics, and although no antibiotic-resistant pneumococci appear to have been isolated, pneumococcal meningitis still constitutes a very serious disease having a mortality rate in well-treated patients approximating 50 per cent in some clinics. This mortality rate of unusual proportions is due in part to the disease afflicting elderly patients with debilitating complications, to delay in starting therapy, and, in some instances, to discontinuing therapy too soon.

Typhoid, Brucellosis and Rickettsial Diseases.—As clinical entities, these diseases do not have much in common. But from a host-parasite viewpoint certain general features are related. Satisfactory therapy was lacking until chloramphenicol and the tetracycline drugs became available. It is significant that although these agents lead to rapid recovery in the vast majority of patients, the microorganisms can persist in the asymptomatic host for considerable periods of time, probably in an intracellular position. Typhoid fever is still a common disease in many parts of the world; a disease of improper sanitation, and even in the United States, a constant threat to human health. Chloramphenicol is the most effective agent available, having reduced considerably the incidence of complications and the mortality rate. Nevertheless, the advancement of efficient antibiotic therapy has not reduced the incidence of the carrier rate. In fact, adequate therapy for the carrier state is lacking. Chloramphenicol is less effective in other forms of salmonellosis. The therapy of brucellosis has long been the subject of investigation in our laboratory and clinics.¹⁰ Treatment with the tetracycline drugs has brightened the picture considerably in the management of human brucellosis, even though relapses and chronic disease can occur in some individuals.

Rickettsial infections represent disease in which classical intracellular parasitism appears, and in which dramatic clinical improvement occurs as a result of antibiotic therapy. During World War II, scrub typhus harried our military personnel in the South Pacific with no effective therapy available, and mortality rates approached 35 per cent in

some areas.¹¹ The tetracycline drugs and chloramphenicol now afford prompt and progressive improvement for scrub typhus.

Tuberculosis.—Before World War II, I used to inform medical students that malaria was the Number 1 infectious disease in the world, and I fortified my statement with a quotation from Burnet,¹² "If we take as our standard of importance the greatest harm to the greatest number, then there is no question that malaria is the most important of all infectious diseases." But with the introduction of effective chemoprophylaxis and chemotherapy, malaria has been relegated to a much less commanding position. Most authorities are agreed that following World War II, tuberculosis took over first position. Like typhoid, tuberculosis is a disease of filth, poverty and poor nutrition. But tremendous advancements in therapy have been induced by the introduction of streptomycin, para-aminosalicylic acid (PAS), and isoniazid. The hopelessness of miliary tuberculosis has been succeeded by dramatic recovery in the majority of properly treated patients. Even tuberculous meningitis can be effectively treated, if therapy is started early in the course of the illness.

Contemporary Problems

Drug Toxicity.—Shortly after the miraculous results of sulfanilamide therapy became apparent to the pharmaceutical industry in the United States, their competitive spirit was more than aroused, and a hurried search for new and related agents was made. Prior to 1938 there were no restrictions on new drugs introduced into interstate commerce. Sulfanilamide would have been a highly profitable drug for any pharmaceutical concern to have synthesized and patented. But it was an old compound, not protected by patent rights, and available to any organization for marketing. Since sulfanilamide was not soluble in the usual safe solvents, one pharmaceutical group decided to market the drug with diethylene glycol as an effective solvent *without carrying out any toxicity studies*. But diethylene glycol was highly toxic, and "Elixir Sulfanilamide" caused over 100 deaths. This resulted in the present Food, Drug and Cosmetic Act, which requires that all new groups must be proved safe for human use before being placed on the market. After 1938, many derivatives of sulfanilamide appeared, each having been care-

fully screened for toxicity and therapeutic activity. Even then only a small number became acceptable on a large scale, and even in the face of new safeguards, not without tragic results. Sulfapyridine, and particularly sulfathiazole, produced severe and fatal renal dysfunction. In addition, the sulfonamides all provoked fever, skin reactions, and in some instances, severe blood dyscrasias.

The same story of drug toxicity has been repeated with the antibiotics. Penicillin, still one of the best of all antibiotics, is not without its dangers. Hypersensitivity reactions induced by penicillin mimic serum reactions. Acute anaphylactic shock with death has been observed on enough occasions to cause any physician to hesitate before administering penicillin to any person, either parenterally or by mouth. The delayed serum sickness-like syndrome with fever, arthralgia, urticaria and toxemia can cause an incapacitating and prolonged illness. In our experience, about 2 per cent of all patients receiving penicillin by parenteral routes express some degree of reaction to the drug, but I have never witnessed a fatal reaction to penicillin at the University Hospitals. The broad-spectrum antibiotics also carry a threat to human health. Chloramphenicol has caused a severe and fatal depression of the bone marrow. The tetracycline drugs can induce a severe enterocolitis, but rarely is this fatal. Approximately 10 per cent of our patients have experienced undesirable gastrointestinal side effects from the tetracycline group.

What attitude should the clinician take toward these antibacterial agents that can produce side effects of varying degrees of severity? First of all, it has not been surprising to me that an agent or agents, altering cellular metabolism of microorganisms so unfavorably that death results, should not on occasion alter the metabolic activity of the host in an undesirable manner. The surprising thing to me is that human beings haven't suffered more ill effects, when one considers the potential dangers, and the tremendous amounts of drugs that have been administered. Furthermore, any drug that alters functional activity of the host, and all drugs probably possess this property, is potentially harmful. A single tablet of acetylsalicylic acid has produced fatal anaphylactic shock on occasion. There is no point in condemning the sulfonamides or antibiotics because they can provoke serious side effects. The attitude of the clinician should be one

of discrimination and caution, employing these antibacterial agents only when his experience dictates that there is a reasonable indication for doing so. As clinicians we should hammer away on the public that the indiscriminate use of any drug is harmful.

The indiscriminate use of potentially dangerous drugs reminds me of Snapper's¹³ story of Paracelsus and antimony. Paracelsus in the sixteenth century recommended antimony by mouth for leprosy, scabies, burns and wounds. But the drug was used without caution, which led to disastrous consequences. In 1566 the Medical Faculty of the University of Paris forbade its use, and in 1580 Heidelberg University required every graduate to take an oath that they would never administer antimony by mouth. However, careful use of antimony by certain discriminating physicians did benefit patients, and after 100 years Paris University rescinded its ban on antimony and recommended it as a useful drug. In a more modern area, antimony proved life-saving in the therapy of kala-azar.

The Appearance of Drug-Resistant Microorganisms.—If anyone, prior to the modern era of therapy, had reviewed carefully the early history of chemotherapy for infectious diseases, he would have anticipated that drug-resistance would have posed many problems with the sulfonamides and with the antibiotics. Ehrlich and his school¹⁴ cited experimental evidence as a background for this phenomenon half a century ago. And, as I have already pointed out, this is precisely what happened with the sulfonamides in the management of streptococcal and gonococcal infections. On the other hand, penicillin has been widely used for a dozen years in the treatment of these infections, and penicillin-resistant strains of Group A hemolytic streptococci and gonococci have not been encountered. This also applies to pneumococci. Penicillin is still highly effective in infections caused by these bacteria; in fact, it remains the drug of choice.

But the story of the appearance of antibiotic-resistant strains of staphylococci has been a very discouraging one. Since our experience at the University Hospitals and at the Minneapolis General Hospital reflects that of many other clinics in this and other countries, some of the highlights of this problem as it has concerned us are given. Fortunately, we have carried out investigations on the

management of staphylococcal sepsis ever since the sulfonamides were first introduced, which has permitted a long-range study of the problem. Before penicillin became available in 1942 drug therapy was of little benefit in severe staphylococcal disease, with the possible exception of sulfathiazole. We had collected sixty-seven strains of coagulase-positive strains of staphylococci from our patients over the period 1937-1942, and when the first lots of penicillin were received *in vitro* sensitivity studies were carried out with these strains. Every strain proved to be sensitive to the action of the drug.¹⁵

Simultaneously, we found penicillin to be quite effective in the therapy of staphylococcal sepsis.¹⁶ But with the passage of time, we, in common with many other investigators, began to isolate an increasing number of strains of staphylococci that were highly resistant not only to penicillin, but to other commonly used antibiotics.^{17,18}

The problem of antibiotic-resistant staphylococci is primarily one of the large general hospitals, and the essential features of this problem may be summarized as follows: Strains of staphylococci isolated from a hospital population may at first exhibit sensitivity to a given antibiotic, but as that antibiotic is more widely used throughout the hospital, resistant strains of staphylococci make their appearance with increasing frequency. In expressing the degree of resistance, we have stated that a strain is highly resistant when *in vitro* growth of the organisms is not inhibited by fifty units or micrograms of the antibiotic. Under these conditions, at the present time, approximately 70 per cent of the strains being isolated from patients at the Minneapolis General Hospital are resistant to penicillin and to streptomycin; about 50 to 60 per cent are resistant to the tetracycline drugs; and 20 per cent resistant to erythromycin.

The relationship of *in vitro* drug sensitivity to the amount of drug being used generally is beautifully illustrated with chloramphenicol. This drug has had but limited use in our clinics, and as a result only 2 per cent of the strains of staphylococci are resistant.* Other important features of the problem of antibiotic-resistant staphylococci are that resistance is a permanent characteristic of a given strain and its progeny, and resistant strains are just as virulent and invasive as the sensitive

*I am indebted to Miss May Collins for data on these tests.

strains. Finally, the reservoir of these resistant strains is in patients and healthy carriers; the latter including hospital personnel, who harbor the organisms in the nasopharynx, intestinal tract, and on the skin. These carriers, including patients, can readily contaminate the immediate environment, such as blankets, dust, utensils, and instruments. The importance of healthy carriers and patients at the University Hospitals acting as reservoirs of antibiotic-resistant staphylococci was clearly demonstrated by Dr. Robert Wise.¹⁹ He showed that about 30 per cent of the surgical personnel carried coagulase-positive staphylococci in the nasopharynx, and a considerable proportion harbored antibiotic-resistant staphylococci. In contrast, patients coming to the out-patient department, mostly from rural areas, rarely carried resistant staphylococci in the nasopharynx. Since infections caused by antibiotic-resistant staphylococci do constitute a serious problem in the hospitals, particularly on the surgical services, concerted efforts should be made to prevent cross infections, and this can be done as emphasized by Howe.²⁰ In addition, antibiotics like neomycin, bacitracin and vancomycin can be used discriminately in the treatment of severe cases of staphylococcal sepsis due to resistant organisms.

Infections Caused by Gram-negative Enteric Bacteria.—A problem closely related to that of antibiotic-resistant staphylococci involves several species of Gram-negative organisms. Just as staphylococci are found widely distributed, not only in the nasopharynx and on the skin of man, but also in his immediate environment, so this group of bacterial species find their reservoir in the intestinal tract of man and in the surrounding environment. The species of bacteria include *Escherichia coli*, *Aerobacter aerogenes*, *Paracolon bacilli*, *Proteus* species, and *Pseudomonas aeruginosa*. These bacteria are not considered to be very invasive, and may exist without harm in the intestinal tract or on the skin, but localization in the kidneys may produce chronic and debilitating disease, and invasion of the blood stream may result in shock and death. These enteric bacilli continue to cause a number of problems in clinical medicine. Since they parasitize the normal intestinal tract of man, they have been exposed considerably to the various antibiotics, which means that an increasing number of strains exhibit resistance to the

drugs. This development is reflected in the difficulties encountered in the management of chronic infections of the urinary tract, especially pyelonephritis. Bacteremia caused by these enteric organisms is often accompanied by shock, which is caused by a surface bacterial polysaccharide.^{21,22} This shock is reversible if prompt action is taken by administering an appropriate antibiotic, and by using a pressor agent, such as norepinephrine or metaraminol.²³

Since infection with enteric bacilli does constitute such a serious clinical problem, every effort should be made to prevent invasion of the tissues and the blood stream of patients following instrumentation of the urinary tract, elective surgery of the colon, and surgery of the biliary tract.

The Sulfonamides and Antibiotics in Agriculture.—This discussion would not be complete without reference to their use in the control and treatment of infections in animals, poultry and in birds. The antibiotics have been highly successful in the therapy of mastitis in cattle, but less effective for blackleg and anaplasmosis. There is some hope expressed for controlling orinthisis in birds with antibiotics.

Perhaps one of the most spectacular applications of the sulfonamides and antibiotics is their use as food supplements for swine, beef, cattle, sheep and poultry.²⁴ In swine, minute quantities of antibiotics increase the rate of growth 10 to 20 per cent with remarkable savings of expenditures for food. Less definitive results have been reported for cattle and sheep. The antibiotics have a definite growth-promoting effect on chicks. The antibiotics have also been successfully used in poultry and in fish as preservatives. The harmful effects of microbial growth in these foods has been prevented by small concentrations of the drugs. It is doubtful that the present day use of antibiotics in agriculture has any serious harmful effects on public health.

Remaining Problems

Many bacterial infections can now be managed with antibiotics, which in turn has led some scientists to conclude that the sun has set upon the discipline of microbiology, and tempered the enthusiasm for clinical investigations in this field. On the contrary, there still remain many perplexing and fundamental problems to be resolved. Although the advancements in the control and management of

infectious diseases have been remarkable, we still have but very meager information as to why a patient becomes ill, and why a definitive pattern of illness is set up following the invasion of the tissues by microorganisms. Why does the patient parasitized by the influenza virus have a severe headache and pains in his muscles? What is the precise cause of a febrile reaction? Why is the diabetic individual prone to acquire more severe infections than the nondiabetic? What debilitating residuals remain in apparently "normal" people following repeated but unrelated infections? It can be assumed that deranged metabolic functions are the cause of illness, which are set in motion by the interaction of the host and microorganisms. A resolution of these dysfunctions can only be brought about by a study of pathological physiology at the level of the host's cells. This means the utilization of many different basic disciplines, including bacterial physiology, enzymology, chemistry and immunology. For the properly trained individual, microbiology, both basic and clinical, still offers a rewarding field of creative effort.

More specifically, there still remain human infections, such as fungus diseases, that have not yet yielded to effective chemotherapy. The most important of these is histoplasmosis, a disease being seen with increasing frequency. While the majority of cases are mild, and recovery ensues, systemic histoplasmosis, and some instances of pulmonary disease, may be a progressive fatal infection. A more hopeful outlook embraces the therapy of actinomycosis with sulfonamides and penicillin; the treatment of blastomycosis with 2-hydroxy-stilbamidine; and the local application of mycostatin (Nystatin) for oral, vaginal and rectal moniliasis. Preliminary investigations indicate that amphotericin B is effective for cryptococcosis, but therapy is wanting for coccidioidomycosis.

Practically the entire field of virus diseases is open for investigations on chemotherapy. The only infections in this category responding to antibiotic therapy are lymphogranuloma venereum and ornithosis, both diseases being caused by antigenically related large viruses. Trachoma responds to sulfonamide therapy. It is difficult to maintain a very sanguine outlook for chemotherapy in virus infections because the microorganisms are so intimately related to the intracellular metabolism of the host. Therapeutic agents for some of the smaller viruses would have to be exceedingly specific. It is not

unlikely that in the long run immunization procedures will be more effective in controlling diseases due to viruses.

As we take inventory of the vast accomplishments of chemotherapy, the history of medicine has emphasized that no infectious disease was ever treated out of existence. Syphilis and gonorrhea have not been eliminated. Typhoid fever and diphtheria still comprise a serious threat to human health in the most advanced communities. Environmental sanitation and strict public health control of food, water and milk are as essential as ever. One case of smallpox in the City of New York could be the bridge to catastrophe, and the appearance of plague in one of our seaports would justifiably cause alarm. Knowledge of the prevention of disease is every bit as important as its correct management with antibiotics.

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Pharmacology of the Tranquilizing Drugs

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SINCE the drugs with which we are concerned are best known for their effects on behavior, especially emotional behavior, we might properly begin this discussion with a brief and greatly simplified description of the nervous system structures which are implicated in the control of such behavior.

Cortical Structures

1. Sensory data are projected from the sense organs to highly specific areas in the cortex which must be intact in order to have sensory discriminations. The functions of these sensory projection areas appear to be rather specific. Thus, destruction of the "visual area" in the occipital lobe results in blindness in man, but does not lead to a loss of other sensory processes or motor function, and surprisingly little disturbance with "higher mental processes," unless any of these functions are directly dependent on vision. Included in this part of the cortex are visual, auditory, olfactory, gustatory and tactile senses, and pain.

2. Another large area of the cortex has rather specific functions relating to voluntary motor activity. Lesions in this area may lead to paralysis of specific muscle groups while sensory, and "higher mental processes" are left relatively intact.

3. In the remaining large areas of the cortex there are fewer specific centers to which the other cortical functions are assigned. It is generally assumed that these areas of the cortex function in the control of such complex processes as thought, judgment, learning, remembering, et cetera, but detailed evidence concerning specific function is very limited. There are some indications that judgment may be impaired by lesions in the prefrontal areas, and that parts of the frontal and temporal lobes have important functions in the control of emotional behavior, but no sharp division of func-

tion can be assigned to specific cortical areas on the basis of present evidence.

Subcortical Structures

1. Certain areas, and especially the hypothalamus, are associated with emotional behavior, such as anxiety, fear, anger, worry and the emotional state associated with pleasure. Stimulation of certain areas in the hypothalamus and related diencephalic structures result in behavior similar to that observed under conditions of strong emotion. Conversely, ablation of these same areas may result in extreme placidity and lack of emotional reaction.

2. Closely associated with the above subcortical areas are other regions that appear to exert direct regulatory influences on a wide variety of homeostatic mechanisms. These are the important processes to the organism of circulation, respiration, digestion, etc. These can be maintained in decerebrate animals and appear to be regulated directly by these subcortical neural structures. It should also be noted that this homeostatic regulation depends in large part on the hormonal mechanisms of the endocrine system. The hormone "master" gland, the pituitary, has such a close functional relationship with the hypothalamus that it is impossible to divorce the endocrine aspects of homeostatic regulation, and certain phases of emotional activity, from the action of subcortical neural structures. Stimulation and ablation studies again reveal that these areas are intimately concerned with the homeostatic regulation of many aspects of the internal environment such as blood pressure, pulse rate, blood sugar, and temperature regulation. These changes are mediated primarily through the autonomic nervous system and the endocrine glands. Furthermore, changes in these aspects of the internal environment occur with great regularity, associated with changes in emotional behavior.

3. Subcortical structures are also very much involved in the control of the involuntary muscula-

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ture. This includes both the various smooth muscle structures in the body, and certain striated muscles. Several groups of these striated muscles are those involved in facial expression and posture. The hypothalamus is only one of the structures involved in this function. However, there is good evidence that lesions in this region may interfere with such involuntary muscle control as that involved in emotional facial expression, while voluntary control of these muscles is left intact.

4. One of the other primary functions of this region is simple conduction of impulses over various fiber tracts to and from the cortex, sensory receptors, muscles, and glands. The subcortical areas appear to modify cortical activity and in turn are modified by the cortex. For example, sleep and waking cycles, which are obvious examples of modified cortical activity, appear to be under rather direct control of centers in the hypothalamus. Sleep may be induced or prevented at will by appropriate stimulation, or ablation of these subcortical structures. On the other hand, we have all learned that sleep may be profoundly influenced by such sensory, motor or "psychic" functions, as listening, walking and planning for the future, all of which are presumed to reflect cortical activity. One of the most important aspects of subcortical influences on cortical function involves the so-called "reticular activating system" in the brain stem, midbrain and diencephalon. This system is excited to some extent by any sensory stimulation. It is markedly excited under conditions of emotion. Reticular activity is presumed to increase the general reactivity of the entire cortex. It has been functionally associated with the behavioral phenomena of "alertness," or "readiness to respond."

The assumption is often made that any procedure which affects such "higher mental processes" as decision making must act upon the "higher mental centers" in the cortex. This discussion of the neural mechanisms of behavior is intended to emphasize the complete fallacy of such an assumption. Complex behavior involves the action of sensory receptors, effector organs, and highly complex interactions in the nervous system. Changes in such behavior can be brought about by disturbances anywhere along this chain of functional units.

We now turn to the pharmacology of the most important tranquilizing or ataractic drugs.

Reserpine

This is an alkaloid obtained from the Indian plant, *Rauwolfia serpentina*. The dosage range is from a fraction of a milligram to several milligrams. It can be administered by injection or by mouth. In animals it produces a striking picture of quiet and tranquility. Animals that are frightened or wild become tame and indifferent to danger. The effect of a single moderate dose is produced after a latent period of one or two hours and may last for several days. There occurs no mental confusion, no difficulty of movement and no personality changes. In this respect this drug is strikingly different from the barbitol hypnotics. The electroencephalogram following the administration of this drug shows a relatively normal pattern, whereas barbitol hypnotics show a sleep pattern. Additional effects produced are miosis, an anti-emetic action, hypothermia, increased secretion and motor activity of the gastrointestinal tract, bradycardia and a drop in blood pressure, and abolition of pressor reflexes from the carotid area. Electrical stimulation of the anterior hypothalamic region shows many of these same effects. Therefore, and because reserpine has shown no actions on peripheral structures to account for these actions, the drug is presumed to have its action primarily on subcortical areas such as the hypothalamus. The acute toxicity of the drug in animals is not very great and no chronic toxicity has been observed in animals. The crude plant contains several other alkaloids, some of which are equally active and others not.

Joseph V. Brady,¹ of the Walter Reed Army Institute of Research, has used a behavioral test in rats and monkeys for studying this type of drug. The animals, after being deprived of food and liquid for twenty-four hours, are placed in a container where they learn to press a bar to obtain a small amount of food or a drop of liquid. Soon the technique is changed so that they are awarded with food or drink on an average of only once in sixty seconds. These training periods of several hours are used on a number of days during the week. As a result, the animals can be stabilized on this regime. Then another stimulus is added which consists of a clicking noise lasting three minutes and terminating in an electrical shock administered to the feet of the animal. The animals soon learn to recognize the auditory stimulus terminating in the shock by showing a "fear" or

"anxiety" reaction. This reaction consists of crouching and defecation, and a reduction in bar pressing. This three-minute anxiety-producing stimulus is given at seven-minute intervals. The behavior of the animals during both the three-minute and the seven-minute periods is recorded electrically. The response of the animals can be changed as follows with certain drugs: Amphetamine leads to a 100 per cent increase in bar pressing during the seven-minute, so-called control period, whereas during the three-minute anxiety producing period, the bar pressing is reduced to zero. On the other hand, under the influence of reserpine, bar pressing is reduced 50 per cent during the seven-minute control or anxiety free period, whereas during the three-minute anxiety producing period, inhibition to bar pressing is removed. In other words, the anxiety is not produced or else the animal is made indifferent to the stimulus, and proceeds with its bar pressing at a rate equal to that seen during the original seven-minute so-called control period. Thus it can be said that reserpine tends to block the reactions due to anxiety or fear.

Chlorpromazine

This is a synthetic drug introduced in France in 1953.² It is related chemically to certain antihistaminic drugs but of itself does not have this action. The dosage range, generally given by mouth, varies from 50 to 100 mg. repeated several times in twenty-four hours. Like reserpine, this drug also produces quiet and tranquility in animals. The action comes on more rapidly and is of shorter duration than that produced by reserpine. Again, anxiety and fear in animals tends to be changed to indifference. Neither drug will produce full hypnosis or general anesthesia. This drug, in the experimental animal potentiates various barbitol hypnotics, ether and alcohol. For the latter drug it also suppresses psychomotor excitement and increases toxicity. It does not potentiate analgesics. It potentiates the action of certain synthetic curare-like drugs but does not reduce toxicity. It is not anticonvulsant. In addition, in experimental animals, the drug also is anti-emetic, produces hypothermia and depresses thermoregulation, reduces gastric secretion, blocks pressor reflexes arising in the carotid area, may produce a slight fall in blood pressure, shows a strong

blocking action against epinephrine and will prevent death in an animal from up to six lethal doses of epinephrine, blocks norepinephrine or levarterenol slightly, blocks edema and capillary injury produced by certain drugs by an action not associated with histamine block and has a weak analeptic action against the laboratory anesthetic, urethane. Again it appears that this drug, like reserpine, acts on subcortical areas, perhaps chiefly the hypothalamus. The mechanism of action of these two drugs has been extensively studied. In the present state of our knowledge these mechanisms appear to be quite unlike.

Preston³ has submitted a possible mechanism of action for chlorpromazine from studies on the central nervous system in the cat. He used a dose (10 mg. per kg. body weight) within the human clinical dose range which also produced a tranquilizing action in the cat. He found that the drug increased nervous discharges from the amygdala to the hypothalamus and that this increased discharge into the hypothalamus depressed or arrested the activity of this region. Depression of the hypothalamus, as far as can be determined, could account for the typical tranquilizing action of this drug. Stimulation and ablation studies in this region support this mechanism of action. As the dose of chlorpromazine is increased, this increased discharge rate of nervous impulses spreads to other areas leading ultimately to generalized convulsions. This effect appears to be similar to the action of this drug in man, where a Parkinsonian type of convulsion has been reported. Preston, and other workers also, have found that the depression of the reticular activating system produced by chlorpromazine is slight. Therefore, the above described actions take on mere significance.

Heistad,⁴ at Minnesota, has studied the action of chlorpromazine on a conditioned emotional response in rats using a technique similar to that used by Brady in his study of reserpine. The results obtained were similar, although at a dose of 2.5 mg. per kg. of body weight given in intraperitoneal injection, the ability of chlorpromazine to block the reactions due to anxiety or fear was not as great as Brady reported with reserpine.

There are several other members of the group of tranquilizing drugs. These drugs for which we have even less pharmacologic knowledge are the following:

Meproamate, Miltown, Equanil.—This drug also appears to have an action chiefly on subcortical regions of the brain.⁵ It produces the same quieting effect with indifference to fear characteristic of the other drugs under consideration. It also inhibits the righting reflex and in large doses produces a reversible flaccid paralysis of skeletal muscle. Further actions include its ability to produce a slight drop in blood pressure and pulse rate, an ability to potentiate barbitol hypnotics, a protective action against strychnine convulsions and a protective action against the extensor phase of electroshock seizures. Hendley and his associates⁶ found that Miltown caused a marked synchronization with moderate slowing of the frequency of brain waves in the experimental animal. This might suggest a mechanism of tranquilizing action for this drug, because the reverse type of brain waves, namely asynchronous activity, is responsible for a normal waking record.

In man, the dose of this drug begins at 100 to 200 mg. given several times a day. Dickel and his associates⁷ have studied the action of this drug in patients with neuromuscular tension and anxiety. In addition to relieving the anxiety, the drug was found to have another action: using the electromyograph they found better relaxation of muscles on the one hand and improved co-ordination of muscles on the other. If this effect is confirmed, it would indicate that the muscle relaxing action of the drug is of some value.

Azacyclonol HCl, Frenquel.—This drug is antagonistic to cerebral stimulants in mice and rats, and to the CNS stimulation produced by morphine in cats.⁸ It also potentiates the action of barbitol hypnotics. It has one other interesting known action. The chemical lysergic acid diethylamide produces schizoid changes (hallucinations) in man when given in minute doses. This disturbance can be rapidly terminated with Frenquel. The dose of this drug begins at 15 mg. repeated several times a day.

Promazine, Sparine.—Chemically this drug is chlorpromazine minus a chlorine atom. With this close chemical relationship it is not surprising that its action is very like that of chlorpromazine. In studies reported to date it appears to produce almost identical pharmacologic effects. The dosage of promazine is the same as chlorpromazine.

Indications for the Use of these Drugs

These drugs are indicated chiefly in psychiatric disorders characterized by the symptoms of excitement, delirium, tension, agitation, anxiety, worry, fear and depression. These symptoms of themselves are not of extreme importance, for every normal individual at times experiences one or more of them. Most normal individuals learn in the process of growing up how to use these emotions for improving their education, or living, or working surroundings or associations with other individuals. It can be said then, that these emotions can and do serve a useful purpose. At times, however, the stimulus leading to one or more of these emotions may be extremely intense and prolonged, as for example during a catastrophe, or during a self-limited illness, such as delirium tremens. In certain of these instances a physician is justified in considering a limited use of one of these drugs. On the other hand, in certain clinical disease entities, such as schizophrenia, these symptoms may become so powerful that they lead to a marked and prolonged alteration in behavior relating to the patients surroundings of physical objects, and other individuals. Various forms of therapy are in use, and a certain measure of success is attainable with each, but no therapy is known to date that is successful in every patient. Only one other drug therapy will be mentioned. The above types of emotions in both normal individuals and in psychiatric patients can be fairly well controlled with barbitol hypnotics. These drugs have an over-all and marked depressant action on the entire central nervous system. As a result, in order to obtain emotional control, the barbitals will produce additional actions such as sleepiness, hypnosis, disturbed and dulled mentation, and various degrees of motor incoordination. In this condition, patients obviously cannot take care of themselves.

The ataractic drugs, on the other hand, appear to act by producing a block or inhibition at one or a few relay centers in the neural pathways associated with the abnormal behavior produced by emotional overactivity. This action appears to be on the subcortical areas, thus leaving the cerebral areas, necessary for our highest mental processes, in a relatively normal condition. As a result, when the stimuli to abnormal behavior are removed or the patient becomes indifferent to these emotions,

he or she can carry on a much more normal day-to-day life.

It should be emphasized that these drugs produce only symptomatic relief. No evidence is available that they are curative. Whether long-time use of one of these drugs by blocking abnormal behavior can lead slowly to the initiation of nervous impulses elsewhere, perhaps in the cerebrum, to depress or inhibit the origin of these persistent and therefore troublesome emotions, remains to be proven. Thought processes may be abnormal or pathologic in disease entities. There is no evidence that the ataractic drugs can change these abnormalities in a normal direction.

Unfortunately, too, the use of these drugs has brought with it a number of side effects. Chlorpromazine and reserpine may cause extra pyramidal disturbances like Parkinsonism. Sometimes only after a disturbance of this type does the drug show any benefit. This disturbance suggests a facilitation of motor nervous impulse conduction. It can be controlled with a drug like tri-hexphenidyl HCl (Artane HCl) given concurrently. If control is obtained, the ataractic drugs need not be discontinued. Chlorpromazine may produce convulsions or agranulocytosis. It would appear that in these instances the drug should be discontinued. Chlorpromazine may produce jaundice. One school of thought, believing this due to an obstruction in the biliary passages which is self limited, suggested that the administration of the drug may be continued. Another school of thought believes this to be an allergic manifestation and that the drug should be discontinued.⁹ Both reserpine and chlorpromazine have been known to produce depressive psychotic reactions (over 200 have been reported with reserpine as of June, 1956). This suggests that the drugs change the emotional status with resulting behavioral effects but not necessarily in the direction of normal. Reserpine, being the chief offender, should not be used in depressive states. Because reserpine increases gastric secretion it should not be used in gastric disturbances. Whether the newer drugs in this series are less prone to produce side effects or not remains for the future to prove. Drowsiness and allergic reactions are a possible side effect with any of these drugs. DeFeo and Reynolds¹⁰ have reported that reserpine can disturb the menstrual cycle in the Rhesus monkey.

This effect therefore is a possible side effect in human patients.

A caution concerning the use of reserpine has recently been made available by Dr. Ralph G. Smith¹¹ of the Food and Drug Administration, Washington, D. C. He has collected data on the clinical use of this drug from which the following conclusions have been drawn: (1) A dose of 0.32 mg. of reserpine per day raises the gastric secretion and gastric acidity in a significant number of cases; (2) a dose of 0.5 mg. of reserpine per day for a period of two weeks produces the same change in acid secretion in most patients and this has resulted in massive gastrointestinal hemorrhage and ulcer perforation; (3) a dose of from 0.5 to 1. mg. per day has produced severe depression in a significant number of patients and has precipitated a number of suicidal attempts; (4) a dose of 0.75 mg. per day and up should be given to patients only in a hospital and under careful supervision; and (5) a dose of 0.25 mg. of reserpine per day has shown none of the above untoward effects.

Summary

A group of drugs with pharmacologic actions quite different from that of any other group of drugs has been introduced into medicine. This group, the ataractic drugs, appears to effect chiefly emotions and thereby emotional behavior. However, serious side effects and the danger of overuse and abuse are important reasons why physicians should use them judiciously. It is possible that overuse, which may be a distinct abuse in many patients, may do more harm than good in our civilization.

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Treatment of Communicating Hydrocephalus by Spinal Subarachnoid-Omental Bursa Shunt

Preliminary Report

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THE lack of a consistently satisfactory surgical treatment for communicating hydrocephalus, whether congenital or acquired, has remained a frustrating obstacle despite the best combined efforts of physicians and surgeons concerned with patients so afflicted.

That no one procedure for the control of this condition has proved completely adequate in the past is well attested to by the large number of operations devised to divert the cerebrospinal fluid to various extranevous depots, potential or real. To list the types and forms of surgical material employed in accomplishing such diversion of the cerebrospinal fluid is to give testimony to the ingenuity of physicians, past and present, and to the astounding tolerance of the human organism for foreign bodies.

When the ventricles of the brain communicate freely with the spinal subarachnoid spaces, and the basic difficulty resulting in progressive internal hydrocephalus is the apparent inability of the cerebrospinal fluid to gain egress (to be adequately absorbed) from the central nervous system, the resulting condition has been termed "communicating hydrocephalus." It may be congenital or acquired following inflammatory changes in the brain and spinal cord.

Some few persons maintain, in contradistinction to this explanation, that the basic defect is one of overproduction of cerebrospinal fluid rather than faulty absorption. However, whatever the underlying mechanism, the commonest surgical procedures devised have been those by which an attempt has been made to deposit the excess of cerebrospinal fluid in an extranevous depot.

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The pertinent literature is exceedingly large and many operations have been described. In the main those operations designed to lead the cerebrospinal fluid from the spinal lumbar sac to the subcutaneous tissues of the back (seton procedure), to the interstices of the vertebral bodies, or through the vertebrae to the retroperitoneal space, to the ureters, to the abdominal cavity either intraperitoneally or retroperitoneally, to the Fallopian tubes, or to the urinary bladder have been used most frequently.

After a review of our own results with various types of shunting procedures designed to relieve communicating hydrocephalus and talking with Dr. Jorge Picaza¹ of Havana, Cuba, it was decided to shunt the cerebrospinal fluid from the spinal subarachnoid space to the lesser omental bursa. The operation is relatively simple and can be done by the neurosurgeon, or jointly by a neurosurgeon and an abdominal surgeon.

The patient, after suitable premedication, is anesthetized with sodium pentothal, curare and nitrous oxide, and oxygen is administered in liberal amounts. An endotracheal airway is always employed. In infants and small children, ether with an endotracheal airway is used. A plastic intravenous cannula or needle of large caliber is always inserted prior to the positioning of the patient on the operating table. The indifferent electrode for the electrosurgical unit is placed routinely on the right thigh (the up side) to avoid undue pressure or venous stasis.

With the patient placed in the lateral decubitus position with the right side up, the skin is prepared over the entire operative field, abdomen and spinal column. The patient is then draped so that the fields of the two incisions are included. Thereafter, the abdominal site is draped out of the field until after the operation on the spinal column. An operating table adaptable to lateral

tilting is used and the patient is tilted, with his head lower than his feet, into a position that makes the spinal column more accessible than

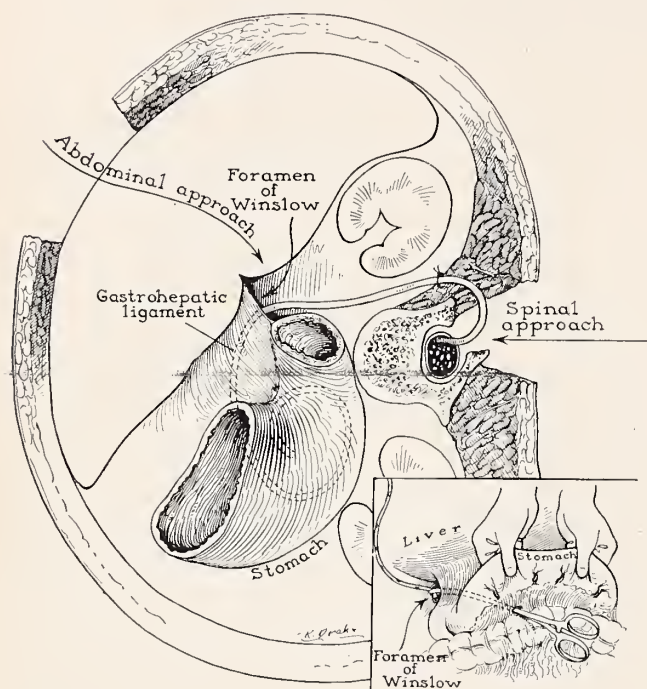


Fig. 1. Diagram showing anatomic structures and placement of the polyethylene tube connecting the spinal subarachnoid pathways with the lesser omental bursa.

it is with the patient in the direct lateral decubitus position.

A midline incision is made over the upper lumbar vertebrae and laminectomy is performed at the level of the first lumbar vertebra on one or both sides depending on the age and size of the patient. The spinal dura is opened, a polyethylene tube of appropriate size for the patient is threaded down into the spinal cul-de-sac after three or four lateral perforations are made in the tubing, and the dura is resutured. The polyethylene tube is then ready for introduction through the paravertebral muscles into the peritoneal cavity. It is anchored by silk sutures. The curve of the tubing is usually very gentle.

After the polyethylene tube has been put in place in the spinal subarachnoid space, a transverse incision is made in the right upper abdominal region. The incision extends from just beneath the thoracic cage to a point approximately 1.5 inches above the umbilicus. The right rectus muscle is then retracted medially and the peritoneum is opened. The stomach and colon are delivered from the abdomen, an opening is

made through the gastrocolic omentum, and a long curved forceps is passed through the lesser omental space and out the foramen of Winslow. The polyethylene tube is passed through the paravertebral muscles, grasped by the curved forceps previously placed and pulled into position in the lesser omental space. Four to six small holes are made at 1-inch intervals in the side of the tube and the tube is irrigated with a saline solution containing six units of heparin per cubic centimeter. The tube is then coiled loosely and placed within the lesser omental space so that it lies flat behind the stomach. Placement of the tube in this position prevents omentum and intestines from becoming adherent around the openings in the tube and thereby helps to avoid obstruction (Fig. 1). The opening in the gastrocolic omentum is closed with a continuous suture and the operation is completed.

The postoperative course is usually uneventful. For the first two to three days the foot of the patient's bed is elevated to prevent too marked emptying of the ventricles. The foot of the bed is gradually lowered over the ensuing few days. Abdominal sutures are removed on the seventh day after operation, or the wound may be closed with a subcuticular stitch. The skin sutures in the spinal incision are removed on the seventh to eighth day after surgery.

Except for infants, the patients are permitted to walk on the third or fourth day after the operation; they are often ready to leave the hospital by the tenth day.

The report following is an example of a rather typical case in which this procedure has been employed.

Report of a Case

Case 1.—A baby girl, whose birth via breech delivery had been without difficulty, was jaundiced, listless and did not feed well on the morning of her fourth day. Examination at the Mayo Clinic revealed a four-day-old, jaundiced, listless girl whose temperature was 98° F. The pulse rate was ninety-six beats per minute and respirations were recorded at eighteen per minute. Circumference of the baby's head was 37 cm. The anterior fontanelle was noted to be full and tense. Stimulation caused the child to give a weak cry but she moved all her extremities well. Her deep tendon reflexes were hypoactive. On examination, the eye grounds appeared normal; clinical examination of her heart, lungs and abdomen did not reveal any abnormality. Roentgenograms of the head and thorax were reported as within normal limits. The concentration of hemoglobin was 13.1 gm. per 100 cc. of blood. The

erythrocytes numbered 3,070,000 and the leukocytes, 3,100 per cubic millimeter of blood. Routine analysis of the urine gave normal results, and cultures of venous blood did not show growth of organisms.

Subdural taps were carried out because of the possi-

On March 12, 1954, ventriculography, dye studies and insertion of a silk seton² were carried out. The ventricles were tapped through the anterior fontanelle and a clear colorless fluid was obtained under pressure. The ventricular fluid was analyzed and found to contain

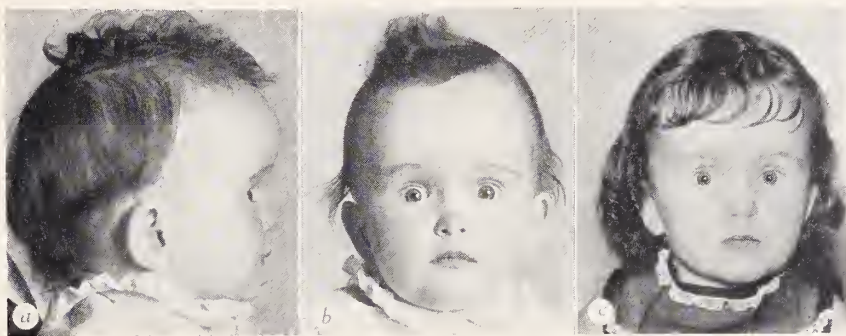


Fig. 2. (a) and (b). Appearance of the child in the case reported herein, one year after the shunt (April, 1955). (c). The same child's appearance two years and three months after subarachnoid omental-bursa shunt (July, 1956). Note that from the appearance of shoulders and arms the child's body is beginning more nearly normally to approximate the proportions of the enlarged head.

bility of the existence of a subdural hygroma or hematoma but the results were negative. Lumbar punctures were carried out, the first of which revealed bloody cerebrospinal fluid containing 240,533 erythrocytes and 1,800 leukocytes per cubic millimeter. The child's condition improved during her hospital stay of fourteen days. At the time of her dismissal she was feeding better, her jaundice had disappeared, the anterior fontanelle was soft and flat and the circumference of her head was 38 cm. It was felt that she had suffered an intracranial hemorrhage during or subsequent to labor, and the prognosis for normal mental development was considered guarded.

When the child was four months of age, her family physician referred her back to the clinic because her head was increasing in size faster than it should. The only unusual thing noticed by her parents in her otherwise normal development was that the child seemed unable to keep her eyes fully open.

Examination at this time revealed that the child was hydrocephalic with a large head and "setting sun" characteristic eyes. The anterior and posterior fontanelles were bulging and tense and the sagittal suture was separated. A cracked-pot sound was noted on percussion of the head. In the occipital region a hemangioma of the scalp was present. The circumference of the head was 46.5 cm., an increase of 8.5 cm. since the baby's first admission four months previously. Vision and hearing seemed intact. The child was alert, moved her extremities well, but had some difficulty lifting her head. Nystagmus was noted on lateral and attempted upward gaze. There appeared to be a paralysis of upward gaze and retraction of the upper lids. Results of the general examination and the examination of the eye grounds were within normal limits. Roentgenograms of the skull now showed a large, thin calvarium with bulging of the anterior fontanelle.

a total protein of 10 mg. per 100 cc. and a cell count of one lymphocyte. Roentgenograms made after 2.5 cc. of indigo carmine was placed in the lateral ventricles showed marked dilatation of the lateral ventricles without shift and without filling of the third and fourth ventricles. Half an hour after the dye had been introduced, a lumbar puncture was done; it showed dye in good concentration. The results of these tests suggested the presence of a communicating hydrocephalus. A silk seton was placed in the lumbar region³ to connect the lumbar subarachnoid space and the lumbar subcutaneous tissue and allow drainage of cerebrospinal fluid. At the time of the child's dismissal the circumference of her head was 48 cm. The family physician and her parents were instructed to measure the circumference of her head at frequent intervals and record it.

During a three-week period the circumference of the child's head increased 1.5 cm., and it was believed that the seton was not relieving the intracranial pressure adequately. Consequently, on April 5, 1954, an encephalogram was made to establish the patency of the cerebral aqueduct. It was found to be patent.

On April 7, 1954, a procedure was carried out whereby the cerebrospinal fluid was shunted from the lumbar subarachnoid space to the lesser omental bursa. The procedure was tolerated well by the child and her convalescence in the hospital was uneventful. She was dismissed to go home on the tenth day after operation, with her wounds healed and the sutures removed.

The child was re-examined in July, 1956, at the age of two and one-half years, and two years and three months after the operation. Her development, both physical and mental, has been most satisfactory, and she is considered normal by her parents. Her head is still large, however, in proportion to her body, but she has lost most of her hydrocephalic features, such as the "setting sun" eyes Fig. 2(a), (b) and (c).

At this time (July, 1956) our experience with the shunting of cerebrospinal fluid from the subarachnoid space to the lesser omental bursa has been limited to twenty-six patients, of whom twenty-three were infants and three adults. This paper is a preliminary report of our use of the procedure. The need of further time and more experience is well recognized as absolutely essential before any valid conclusions can be drawn as to the real efficacy of such a shunt in cases of communicating hydrocephalus to allow for adequate cerebral compensation.

However, our very limited experience to date suggests that such an operation may offer certain advantages to the patient until the time when medical science has developed enough to allow a more definitive attack on the basic underlying cause of the pathologic entity.

Spinal subarachnoid-omental bursa shunt can be employed with equal ease in tiny infants and adults of either sex. The loss of blood incidental to the operation is minimal, shock is negligible and convalescence is usually uneventful. Since the cerebrospinal fluid is reabsorbed by the body, electrolyte deficiencies are not encountered as with other procedures.

No organ is sacrificed and there is no need for preliminary intravenous pyelography, tests for renal function and so forth or for such things as mechanical valves, end buttons, connectors, or

joints. Such theoretical possibilities as plugging of the shunt by omentum are avoided. Extra lengths of tubing can be left in place to allow for growth if the patient is an infant. The caliber of the tubing can be practically unlimited except for the tiniest of infants. Patency of the tube can be checked subsequently by making roentgenograms after radiopaque substances are placed in the spinal subarachnoid space. Early ambulation can be practiced without fear of dislodging the tube; should ultimate failure of the shunt occur, other avenues of surgical treatment are still open.

Our experience to date with spinal subarachnoid-omental bursa shunt suggests that this procedure may have some merit and that it is worthy of trial and observation in the attempt to alleviate the ravages on the central nervous system of progressive communicating hydrocephalus, whether it be of congenital or inflammatory origin.

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SULFONAMIDE AND ANTIBIOTIC THERAPY

(Continued from Page 221)

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Staphylococcus Infection in a Nursery for Newborn Infants

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ON September 10, 11 and 14, 1955, cultures of inflamed umbilical areas of three newborn infants revealed coagulase positive staphylococci with identical antibiotic sensitivity patterns. It was believed this was sufficient evidence to suspect an epidemic in the newborn nursery. On September 15, definite steps were taken to locate the source of these infections.

The following plan was followed:

1. Inspection and routine nose and throat cultures of personnel of the delivery room, obstetric floor and newborn nursery were done within twenty-four hours.
 2. The personnel in the delivery room, on the obstetric floor, and in the newborn nursery were reinstructed regarding the importance of reporting anything other than normal symptoms concerning their own persons.
 3. Personnel were thoroughly reoriented to the principles of individual technique to be used in the nursery.
 4. The autoclaves were checked.
 5. Cultures were taken from delivery room packs, transfer forceps, nursery table equipment and solutions.
 6. The situation was reported to the State Board of Health.
 7. An inspection was made by the State Board of Health Pediatric Consultant, and his suggestions for changes were carried out.
- The hospital director of nurses assumed the administrative responsibility for the investigation. The hospital bacteriologist did the laboratory studies, and an intern made the inspection of personnel; he also secured routine nose and throat and other indicated cultures.
- The physical inspections and cultures were done on twenty-six people. All the cultures were collected on sterile cotton tipped applicators and

inoculated immediately on blood agar plates; and incubated at 37 degrees centigrade. These cultures were examined at twenty-four and forty-eight hours for the presence or absence of coagulase positive strains of staphylococci. Simple disc antibiotic sensitivity tests were done, and the cultures were sent to the University of Ohio Bacteriology Department for phage typing. On September 16, the day following the investigation, two additional cases of omphalitis occurred in the nursery.

TABLE I. ANTIBIOTIC SENSITIVITY TESTS ON STAPHYLOCOCCI FROM NEWBORNS 1955

Baby	Birth	Onset	Antibiotic Discs							
			P	E	F	T	C	S	B	G
1	9/ 6	9/10	+	+	+	+	+	+	+	±
2	9/ 7	9/11	+	+	+	+	+	+	+	±
3	9/ 8	9/14	+	+	+	+	+	+	+	±
4	9/12	9/16	+	+	+	+	+	+	+	±
5	9/13	9/16	-	+	+	-	+	-	+	±

P—penicillin
T—tetracycline
B—bacitracin
F—nitrofurazone

E—erythromycin
C—chloramphenicol
G—Gantrisin®
S—streptomycin

Our physical inspection revealed that one of the personnel, a nurse's aid who worked the night shift in the nursery, had a respiratory infection manifested by a mucopurulent exudate in her posterior pharynx. Seven of the twenty-six nose and throat cultures, including one from the aforementioned nursery aid, were positive for coagulase-positive staphylococci. The cultures taken from the equipment and solutions in the delivery room and nursery were sterile.

The strain with which we were dealing did not react to any of the specific phage types available, but these slides demonstrate the results of the disc antibiotic sensitivity tests upon the coagulase positive staphylococci taken from the umbilical area of the babies and the noses and throats of the hospital personnel.

It will be noted that the antibiotic sensitivity pattern of the staphylococci from Baby 5 is dif-

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ferent from that of the other four, though clinically the infection was identical to and occurred at the same time as the other four. This can be explained by the fact that the umbilical area of Baby 5 was treated topically with Neomycin for a day prior to securing the umbilical culture.

TABLE II. ANTIBIOTIC SENSITIVITY TESTS ON STAPHYLOCOCCI FROM PERSONNEL

Personnel	Antibiotic Discs							
	P	E	F	T	C	S	B	G
Nurse 1	—	+	+	+	+	+	+	±
Nurse 2	—	+	+	+	+	+	+	±
Nurse 3	—	+	+	+	+	+	+	±
Nurse's aid	+	+	+	—	+	+	+	±
Intern 1	—	+	+	—	+	+	+	±
Intern 2	—	+	+	+	+	+	+	±
Pediatrician	—	+	+	—	+	+	+	±

P—penicillin
T—tetracycline
B—bacitracin
F—nitrofurazone

E—erythromycin
C—chloramphenicol
G—Gantrisin®
S—streptomycin

Though seven persons of the hospital personnel who contacted these babies were carrying coagulase-positive staphylococci in their throats at the time of examination, only one of them (namely, the nursery aid) was carrying an organism whose antibiotic sensitivity pattern matched those of the babies involved in the epidemic. She was also the one person who manifested respiratory disease on the physical inspection.

When this nurse's aid was relieved of her nursery responsibilities, the staphylococcal infection amongst the newborns ceased to occur.

As is often the case, the violation of well-established practices of preventive pediatrics resulted in the unnecessary exposure of the newborns to a potentially serious illness. The nurse's aid who was the carrier had been away from work ill the day preceding recognition of the first case of omphalitis. When she returned to work at midnight, it was decided it would not be necessary to awaken the house officer for the purpose of filling out the routine back-to-work form. The nurse's aid also had a sore throat for several days following her return to work, but apparently did not realize that a "sore throat" was classified as a "self-reportable illness."

All of these cases of omphalitis were minimal in extent. Four were manifested by slight peri-umbilical erythema and one had streaks extending up the abdominal wall in addition to peri-umbilical erythema. None of the infants manifested any symptoms of sepsis. The infants were isolated and their infections responded quickly to

treatment; there have been no complications subsequently observed.

Since this experience, we have been watching for further outbreaks of staphylococcal infections occurring in the infants in the nursery or becoming manifest after they leave the nursery. Many cultures have been taken on suspicious skin and eye lesions, but not until almost a year later was another staphylococcal infection diagnosed. On September 7, 1956, the nurses discovered on a routine admission an impetiginous bleb on an infant boy. The infant was isolated, and the lesion was cultured and treated. Two days later a second infant in the nursery was noted to have an infection in the right eye and an infected area in the left groin. This infant was isolated, her lesions were cultured, and local treatment commenced, but the following day she had several moderate sized blebs in the vulvar area and purulent vulvulitis. Systemic treatment was started, and the lesions promptly regressed and she recovered. The cultures from the lesions of both these infants grew out coagulase positive staphylococci whose antibiotic sensitivity patterns were identical. The mother of the infant boy who was born with a staphylococcal impetiginous lesion manifested no signs of infection during her prenatal, paranatal or postnatal course, although a routine blood count taken from her the day following delivery revealed a WBC of 15,200 with a differential count of 88 per cent polymorphs, 10 per cent lymphocytes and 2 per cent monocytes.

No additional staphylococcal infections have been noted in the nursery since the time of this last outbreak. Moreover, we are aware of none that could have originated in the nursery and become manifest after discharge.

The potential seriousness of staphylococcal disease in the newborn age group requires no emphasis to this group here tonight. We have all had the difficult privilege of caring for a tiny infant with staphylococcal sepsis or its complications. At the fall meeting of this Society in 1955, Dr. Richard Smith reported a staphylococcal epidemic in the newborns at the University of Minnesota Hospitals. His report indicated that, although an epidemic might first manifest itself in minimal skin lesions, it could crescendo into serious and possibly fatal complications.

These experiences tend to confirm our opinion

(Continued on Page 237)

The Diabetic Foot

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ONE OF the greatest challenges to the practicing physician is presented by those patients who have diseases for which there is no real cure and whose treatment consists of an attempt to prolong useful function for as long a period of time as is possible. One such peripheral vascular disease which is frequently seen is the "diabetic foot." This may first be seen in an advanced and serious form or it may have signs and symptoms which are of minimal significance. Either way, it poses a difficult therapeutic problem.

For purposes of our discussion it is necessary to distinguish the "diabetic foot" from simple arteriosclerosis obliterans. Although simple arteriosclerosis obliterans may occur in the diabetic as well as in the nondiabetic patient, it differs from the "diabetic foot" problem mainly in that it is a much more discrete entity clinically. For example, the sequellae to simple arteriosclerosis obliterans (ulceration, gangrene, et cetera) may be related to various etiologic agents, but the primary difficulty is clearly ischemia. By comparison, in the form of arteriosclerosis obliterans which we designate as the "diabetic foot," the same sequellae may occur but other factors than ischemia are often of prime importance. The treatment and prognosis of this form of arteriosclerosis obliterans in the person with diabetes may also be quite different from that of uncomplicated arteriosclerosis obliterans.

Ischemia is always an important factor in the development of this lesion. However, even here it differs from simple arteriosclerosis obliterans. Frequently, one sees extensive ulceration and gangrene of the distal end of the foot with palpable dorsalis pedis or posterior tibial pulses or both present. At an earlier stage of its development one may demonstrate marked pallor of elevation of a toe with absence of pallor of the remainder of the foot and with normal arterial pulsations present. In other words, the arterial insufficiency is usually in the small vessels and frequently is distal to the palpable pulses.

Infection is another important etiologic agent in the development of the diabetic foot. This

usually starts as trichophytosis with the development of maceration and fissures between the toes. This may become secondarily infected with bacteria and extend into the foot. Careful examination is necessary to determine the extent of the infection. Frequently an abscess is present within the foot. Osteomyelitis may be present.

Perhaps the most often overlooked abnormality, and an exceedingly important one, is the presence of anesthesia or hypesthesia of the distal portion of the extremity due to diabetic neuropathy. The adverse effect of trauma on ischemic tissue is obvious. Less obvious is the increased amount of trauma sustained by an anesthetic foot.

The importance of each of the above factors has to be considered separately in the genesis of the lesion in every patient. This is done by means of a careful history, physical examination, and neurologic examination. It must be done before any treatment can be considered. If treatment is to be successful, it must be directed toward the most important etiologic factors and not necessarily toward the ischemia alone.

The initial treatment of the diabetic foot is almost always very conservative. The only exception to this is the presence of an acute, fulminating infection which represents an emergency. This is rarely encountered since the antibiotics have come into general use. The following factors are of importance in therapy:

1. Infection is almost always present to a variable degree. Antibiotics are usually indicated (this is in contrast to the therapy of simple ischemic ulcers where antibiotics are necessary only infrequently.) Infection of the superficial tissues is also treated initially with continuous wet packs (usually of a saturated solution of boric acid).

2. It must be remembered that the ischemic tissues are very friable. Excessive heat and excessive cold must be avoided. The optimal temperature is 85 to 95 degrees. Another common error in treatment is to elevate the foot if it is swollen. This further intensifies the ischemia and should be avoided. The leg should be kept level.

3. If there is any evidence of an abscess it should be drained.

4. A roentgenogram of the foot should always be taken to determine the presence or absence of osteomyelitis.

Very often the ulcerated lesion will heal with conservative management alone. The patient must then be carefully instructed in regard to the subsequent care of his foot to prevent a recurrence. This instruction must include specific advice in regard to foot hygiene (including fungus control). The patient must also avoid trauma from walking barefoot or wearing ill fitting shoes. The extremity must not be exposed to excessive heat or cold, and self medication of minor abrasions and fissures must always be avoided.

If it becomes apparent during treatment that the lesion will not heal, and that a useful extremity cannot be saved, one must then consider the various surgical procedures that may be used:

1. Amputation of several or all of the toes. This has its greatest value in those patients whose problem is recurrent infection and subsequent ulceration in the spaces between the toes. The procedure is helpful in that it enables the patient to maintain better control over fungus infections. It obviously must be done only in very carefully selected patients where the degree of ischemia is minimal. However, in carefully selected patients the wound will heal, and the useful life of the extremity will be considerably prolonged.

2. Transmetatarsal amputation. The indications for this are essentially the same as for amputation of a toe. It is done when the amount of tissue loss or the degree of ischemia are considered too great to permit healing of a lower amputation. It must be emphasized again that these patients must be selected with extreme care as low amputations rarely heal if the extremity is grossly ischemic. In general, it should be said that

at least one of the pedal pulses should be present, that there should be no gross evidence of ischemia of the proximal portion of the foot, and that there should be no evidence of diabetic neuropathy or of osteomyelitis present before one considers doing a transmetatarsal amputation.

3. Higher amputations. Below knee and above knee amputations are done primarily if the degree of ischemia present is enough that a lower amputation will not heal. There is no disagreement on this point. In the diabetic foot there may be another reason for doing a higher amputation. If a significant sensory impairment is present at the amputation site, the wound will probably soon break down even if an adequate enough blood supply is present to enable it to heal. This is a very important consideration. We feel that when amputation is indicated in the diabetic patient it should never be done below the level of sensory impairment.

4. Lumbar sympathectomy. Although we have liberalized our criteria for selection of patients with occlusive arterial disease for sympathectomy very considerably in recent years, and although we feel that it is a very valuable procedure in well-selected patients, we feel that it is rarely, if ever, indicated in patients with a diabetic foot.

The purpose of this discussion has been to re-emphasize and to present in an orderly manner some of the problems encountered in the diagnosis and treatment of one of the peripheral vascular diseases. It is an accepted fact that effectiveness of therapy is directly proportional to its specificity. If we study our patients carefully and attempt to assess correctly the relative importance of the various etiologic factors in the genesis of their lesion, we will be in better position to treat as specifically as possible. The net result will be that many more extremities will be salvaged.

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FILM ON URINE SUGAR ANALYSIS AVAILABLE

The film, "Urine Sugar Analysis for Diabetics," developed in co-operation with the medical profession, is available at no charge to the medical and allied professions through Ames Company, Inc.

The film was made as a visual aid to be used in the education of diabetic patients and shows the relationship between carbohydrates and insulin. It also explains in lay language the meaning of various diabetic

conditions. It has been produced on 16 mm. film in color and sound track with a running time of approximately 10 minutes. Appropriate "hand-out" literature accompanies the film.

Showings at diabetic clinics, diabetic lay societies and other diabetic groups must be requested by the medical or allied professions to Ames Company, Inc., Elkhart, Indiana, or an Ames representative.

Hypnosis in Obstetrics

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HYPNOSIS is still a controversial subject. The purpose of this presentation is to evaluate and discuss the use, the disadvantages and advantages of hypnosis in obstetrics.

Hypnosis, at the present time, is still meeting with some resistance by the medical profession, although there is greater acceptance in Great Britain. The British Medical Association has officially recognized hypnosis as a useful adjunct in medical practice. Patients who have experienced hypnotic anesthesia for childbirth are unanimous in their approval.

Although hypnosis is a young science, it is rapidly assuming the dignified position it deserves in obstetrical anesthesia. Some universities, such as University College of Los Angeles, Marquette, Texas, and Yale, have teaching classes in hypnosis.

The Use of Hypnosis

Many doctors use hypnosis when they practice Dr. Read's natural childbirth. His relaxation exercises are merely modifications of hypnotic techniques. With this method about twenty-five per cent of patients could be carried through the early stages of delivery without the use of sedation or anesthesia; however, this kind of hypnosis is not effective in the second stage and cannot be used to perform episiotomy or repair without some degree of medical analgesia or anesthesia.

We are indebted to Dr. Read's epochal work however, for having made women cognizant of methods for pain relief other than noxious drugs and anesthetic agents.

I do not wish to imply that hypnosis will ever supplant anesthesia; however, when the use of hypnosis in childbirth is better understood more patients will be receptive to its use and physicians, in turn, will be less resistant to the concept and technique.

Hypnosis is a serious and useful science that should be left in the hands of experts who understand its usefulness as well as its limitations.

Presented at the meeting of the Minnesota Obstetrical and Gynecological Society, Rochester, Minnesota, September 22, 1956.

Disadvantages

Harm would result from the hypnotist's failing to remove a post-hypnotic suggestion completely, thus possibly causing the subject to react with a stiff leg or arm for some days, weeks, or months after he had been hypnotized.

Hypnosis has its limitations in that not all expectant mothers are satisfactory subjects for the induction of complete anesthesia. The number, about three out of five, with whom it would be effective could be greatly increased if time were taken to teach them to become good subjects.

The time required to produce hypnotic anesthesia is, of course, another drawback. The demands of such care require an expenditure of physical and emotional energy on the part of the physician, which is quite impossible for some men. It would be impractical for the average obstetrician and could be made possible only by the limitation of practice to a relatively small number of patients.

The presence of the hypnotist for at least part of the time during labor is essential, especially in the more physically painful termination of the second stage, when the head is riding over the stretched perineum. It may be necessary to reinforce the hypnosis and to keep the nurses away from asking the patient, "Are you sure that you don't want a hypo?"

Hypnotic anesthesia is a highly individual problem and varies from patient to patient and even changes in the same patient under different circumstances. For this reason group-instruction would seem impractical. Concentrated attention can be given to only one subject at a time.

Another practical difficulty is that the patient has to be placed in a room where no other women are in various stages of labor. The moaning and crying of these patients may unnerve her.

Hypnosis should not be used in prepsychotic or neurotic individuals, as a psychosis may be precipitated. But psychotics are difficult, if not impossible, to hypnotize.

Some psychiatrists contend that hypnosis fosters

extreme dependency. This may be true but a strong bond of dependency exists in every doctor-patient relationship. This dependency, however, is only temporary and of no importance. The reason

with each contraction, thereby facilitating and shortening the completion of the expulsive stage.

Reynolds, Harris and Kaiser³ could prove by tokodynamometry, a method to measure the force

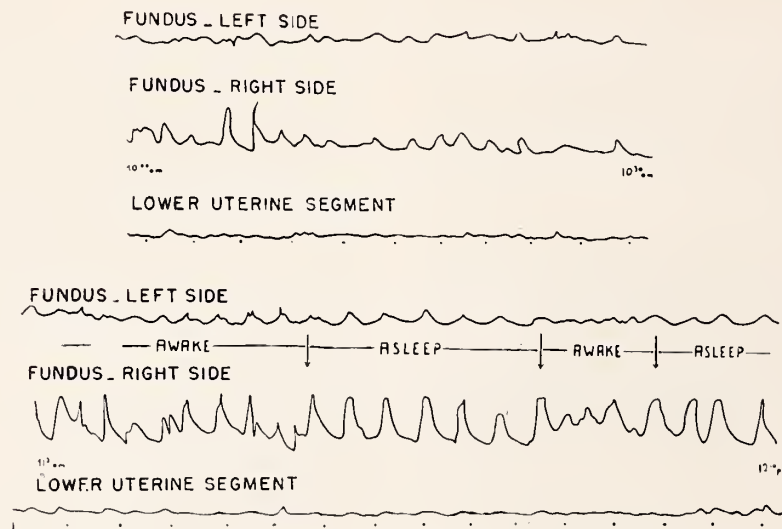


Fig. 1. (Top) This diagram was taken when the cervix was dilated for a finger tip and the patient was not asleep. The contractions are irregular and the profile is uneven. (Bottom) One-half hour later, cervix dilated five centimeters at start, ten centimeters at end of record. Note change in profile as deep sleep was induced and when patient was awake. (From M. Rodriguez Lopez, S. R. M. Reynolds and R. Caldeyro Barcia: Arch. Ginec. Montevideo, 9:16, 1950.)

for the dependency can be worked through and dissolved through post-hypnotic suggestion.

The delicacy one must apply in dealing with hypnosis is another objection to its use. This points up the fact that until its value is more fully understood and accepted, it is a method best accepted by the doctor at the patient's request. These objections, however, can be eradicated if patients understand that the physician is only trying to teach them to assume healthy attitudes and that there are no magic powers invested in him.

Advantages

The late Dr. Lee stated, "The only anesthesia that is without danger is hypnosis. I am irked when I see my colleagues neglect to avail themselves of this harmless and potent remedy."¹

The carefully prepared patient will look forward to her confinement with a feeling of joy and happiness instead of dread and fear and she will be most co-operative during labor. Abramson and Heron² proved that with hypnosis there is an average reduction of two hours in the first stage of labor. During the latter part of the second stage the patient can be directed to bear down

and character of uterine contractions in pregnancy and labor, that there is evidence of effective uterine action by hypnosis.

Case Report

A patient was hypnotized early in pregnancy for painless delivery. When the labor began she experienced no pain but felt uterine activity. After two hours a record of uterine activity was obtained, and the two fundal areas were found to be the most active parts of the uterus (Fig. 1).

The record of the activity obtained at this time is shown at the top records. One hour later it was found that the patient was having stronger contractions without pain and that the cervix was dilated to five centimeters. After twenty minutes a deeper hypnosis was induced. The uterine contractions became strikingly regular and strong. At the end of fifteen minutes the patient was awakened by the hypnotist. The profile of the contractions became irregular. There was still no pain. In ten minutes she was again allowed to sleep and the pattern of contractility reverted to regular, even rhythm, as before. These measurements prove objectively the influence of hypnosis on uterine contractions during labor.

With hypnosis there is absolutely no respiratory or circulatory depression in the mother or the fetus with resulting anoxia, asphyxia and cerebral

damage. It is especially indicated when dealing with the delivery of a premature baby. Furthermore, it is known that one maternal death in one-thousand deliveries is caused by anesthesia, according to R. Hingson.⁴

The principle cause of death before birth and in the first few weeks after birth is interference with oxygen. Anoxia is one of the great killers and deformers during pregnancy. It is now known that much feeble-mindedness is directly due to lack of oxygen during the actual birth process and to heavy doses of drugs. It is also known that prolonged labor and abnormally prolonged contractions of the uterus at the time of birth are two ways in which babies are made anoxic. One factor which can prolong labor and uterine contractions is improper use of painkilling drugs and anesthetics during childbirth.

All drugs given to relieve the mother's pain, with the exception of spinal, caudal or local anesthesia, cross the placental barrier and affect the baby to some degree. It has often been demonstrated by the psychoanalytic approach that such conditions as rigid cervix can be influenced by fear and possibly prolong labor.

Eastman's excellent paper, "Mount Everest in Utero,"⁵ gives us the best explanation about the oxygen condition of the fetus. The fetus exists in a continuous state of cyanosis; a fact that is not only documented by countless blood oxygen studies but is plainly apparent at any cesarean section.

A perhaps even greater tragedy than the actual death of a newborn baby is the birth of a baby whose brain never develops. The incidence of

this condition, cerebral palsy, is much higher than most obstetricians would probably suspect. Of three thousand deliveries about eighteen of the babies born will develop cerebral palsy. More recently opinion has veered toward the belief that the main etiologic factor is intrauterine anoxia, whether intrapartum or antepartum. The cerebrum is one of the first structures injured by anoxia.

As a result of certain drugs and anesthesia the already scant oxygen supply is sometimes reduced to levels which kill or injure untold numbers of infants. On the other hand, there is not the remotest possibility of physical danger to the mother or baby from any type of hypnosis.

Because the lay press has stressed these factors, we have noted that more of our patients are now expressing keen resentment over being "knocked out" by medications. Good obstetric practice must concern itself more with the preparation of the woman's mind and less with the administration of noxious drugs.

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STAPHYLOCOCCUS INFECTION IN A NURSERY

(Continued from Page 232)

that most staphylococcal infections in the newborn age group are preventable,¹ and that the sources of these infections can be detected with the equipment and personnel available in a small private hospital. Our observations in this particular nursery the past 18 months have demonstrated to us the value of a team approach to the problem of newborn nursery epidemics. The key members of such a team would seem to be:

1. A nursing administrator who is able to main-

tain a perpetual training and inspection program in the obstetric and nursery units.

2. A hospital bacteriologist who practices epidemiology as well as diagnostic bacteriology.

3. A staff pediatrician who actively serves as the public health officer of the nursery.

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Hypnosis in Obstetrics

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THAT properly utilized hypnosis may offer ideal anesthesia is a proved fact. That it can be performed with a minimum of apparatus and expense is clear. That it does not cause respiratory or circulatory depression in mother or fetus is evident. These and many other advantages are frequently listed, all with the implication that hypnosis is not a "toxic" agent. I do not agree with this view.

Scope of Hypnosis

Hypnosis is a technique for the induction of sleep, which can be light or deep. In either state, pain is dissociated from awareness; the patient is completely relaxed and is subject to the orders of the hypnotist within the bounds of the patient's own conscience. The technique and the wonders of the interplay involved in such "animal magnetism" have been the secret and the potion of the ancients and the spiritualists. Not until 1841, however, was the psychologic character of the hypnotic state scientifically delineated. At that time, a skeptic, Sir James Braid, was induced to examine a mesmerized subject; starting with a definite contrary bias, he ended his observations by recording not only the validity of the phenomenon but the psychologic nature of the reaction.

Hypnosis, like psychoanalysis, is first and foremost a research tool; what is possible with either approach is remarkable and frequently awesome. Both offer a means of understanding the depths and the intricacies of human behavior but, as is true of many laboratory methods, they should be handled only by those with proper understanding of the subtleties involved. They are best untouched by those caught in wonder but unlearned in psychodynamics.

Hypnosis permits the quantitation of stimuli

The practical experience reflected in this paper was obtained elsewhere. To this date, hypnosis has not been used in the Section of Obstetrics and Gynecology at the Mayo Clinic.

From the Section of Psychiatry, Mayo Clinic and Mayo Foundation.

The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.

and the reliving of an ancient experience. Under proper direction, it may become a form of therapy. The technique of hypnosis merely sets the stage; the direction, manner and interpretation of the hypnotist's suggestions, their meaning to the patient, and the transference phenomena that occur between patient and physician determine the total result of the hypnosis. By implication, successful relaxation during delivery may be only the most superficial and positive effect of the hypnosis.

Hypnosis permits ready acceptance of suggestions, both of a regressive and progressive nature. A patient may regress to an early stage of his life, during which regression he will speak, look and react in a fashion consistent with that age period. He will recall facts and emotions that he had consciously forgotten and that he may be told to remember or forget on awakening, at the discretion of the hypnotist. If hypnotized for purposes of progression, he may be prepared, as is true of the patient before delivery, for constructive and mature behavior in the future. However, the anxieties that will be perceived and the reaction that may occur even out of consciousness cannot be disregarded with safety. The preparations for a happy experience of labor always must be accompanied by the opportunity for ventilation of anxieties and fears.

Hypnotic Analgesia

Kroger and DeLee¹ have presented the many advantages and a few disadvantages of hypnosis as contrasted with other forms of analgesia (Table I).

Only persons who have knowledge of the psychodynamics of the unconscious should use the technique; I wish it were otherwise, for there are few enough such persons. However, psychiatrists gave up hypnosis in the early years for exactly the same reason that obstetricians ultimately might give it up, namely the experience of uncovering more than their knowledge could handle. Now that psychoanalysis has offered more definitive understanding of basic conflicts, hypnosis once

TABLE I. ADVANTAGES AND DISADVANTAGES OF HYPNOTIC ANALGESIA IN OBSTETRICS

Advantages

Technique is simple
 No apparatus is required
 It does not depress circulation
 It does not depress respiration
 It does not depress uterine contraction
 It raises resistance to fatigue
 Analgesic effect is easily controlled
 Pain is dissociated
 Loss of blood is decreased
 Recovery is smooth

Disadvantages

Some patients are not susceptible
 Requires knowledge of psychodynamics
 Later effects may be tragic
 Best done by psychiatrist
 Predelivery and postdelivery contact necessary

TABLE II. INDICATIONS FOR HYPNOSIS IN OBSTETRICS

Home delivery
 Previously unexamined patients
 Premature labor
 Cardiac decompensation
 Respiratory conditions
 Myasthenia gravis
 Uterine inertia
 Bleeding tendency
 Psychiatric conditions

again is being explored in the treatment of psychiatric conditions, for now the hypnotist can use hypnoanalysis and hypnotherapy and not merely open the lines of cleavage of the personality. With proper use of psychodynamics, the unconscious conflict can be carefully controlled and handled.

Barring fear caused by faulty education and with the elimination of women who have inadequate anatomic faculties, the pain of childbirth depends on such factors as the size of the baby, multiparity, previous conditioning to pain, the threshold of pain, suggestibility, the attitude toward the unborn child, the attitude toward the husband and security in the feminine role. The last five of these factors may be susceptible to hypnosis. The most important psychologic factors involved are those related to the security in the feminine role; this is dependent on the quality of kindredness with the patient's mother, which is a deep-seated, complicated relationship with untold ramifications. Suggestion may permit equanimity during labor but, unless accompanied by proper analysis of basic conflicts followed by helpful reintegration, it is potentially dangerous and may be reflected in the patient's decompensation or in that of the child.

Indications for Hypnotic Analgesia

In view of the perfection of other anesthetic techniques, it appears appropriate to use hypnosis only in selected problems of labor. Such conditions are summarized in Table II.

Frequently, the proponents of natural childbirth and hypnosis extol the virtues of wakening the patient so that she may enjoy the pain of labor, the first cry of the infant and even the presumed pleasure of expelling the placenta. These experiences are supposedly of importance in solidifying the mother-child relationship. Rarely

does one note emphasis on an area of much greater emotional meaning to both mother and child, namely the use of hypnosis in stimulation of lactation. With only a session or two, patients frequently can be given posthypnotic suggestions that make nursing possible. The nursing relationship is a highly satisfying experience for the mother, and one that is basic to the child.

Hypnosis in Hyperemesis Gravidarum

I am impressed with the value of hypnosis, meaning hypnoanalysis and hypnotherapy, in conditions such as hyperemesis gravidarum. This disturbance is accepted by most physicians as being related to some basic psychosomatic condition. For years obstetricians have accepted the role of suggestion in the apparent efficacy of therapeutic agents. Sir Arthur Hunt, from the turn of the century, accepted pernicious vomiting as a symptom of hysteria. As such, it represents the unconscious wish to reject the child, based on an infantile view of oral impregnation. Many children initially believe that babies lie in the stomach and that entry is via the mouth; jealousy of the pregnant mother frequently is expressed by oral incorporation of many objects, and such children fantasy that the mother may vomit that which lies in her stomach. The choice of symptom, namely vomiting, represents in these women the childish strain of personality that remains and determines the expression of the rejection wish. Frequently, of course, these women insist that they want the fetus; without realizing it, however, they have unconscious wishes and drives to the contrary. Since the rejection wishes are unconscious in nature and since, once the condition has developed, time is at a premium, hypnoanalysis and hypnotherapy offer the quickest and, if properly controlled, a safe method of obtaining the unconscious material on which interpretive reintegration may be possible. The cases reported by Kroger and DeLee¹ indicate the results that are possible; of their seventeen patients who had pernicious vomiting, fifteen were successfully treat-

ed, one aborted and one could not be hypnotized. If a patient cannot be hypnotized, it may be because of her exquisite need to maintain the defenses that protect her, even if inadequately; it is possible that a psychotic break might follow if continued attempts at hypnosis are made in such cases.

Hypnotherapy offers a quick and definitive form of treatment in hyperemesis. The dramatic symptomatic relief that may follow even a single session is empiric evidence of the power of the hypnotic tool. It can be equally effective in heartburn, simple vomiting and threatened abortion. The hypnotic technique should not be used only for analgesia. It can be used with benefit for control of various psychosomatic obstetric conditions.

Dangers of Hypnosis

The dangers of hypnosis develop when suggestions are made toward a single symptom; if hypnotic suggestion disregards conflicts in personality, subsequent psychologic decompensations occur. Papers on the subject of hypnosis as an anesthetic agent measure failure in terms of failure to induce relaxation. Rarely reported are the psychologic states of the mothers after delivery. Mandy and associates² reported the postdelivery courses of three mothers who underwent presumably successful natural childbirth. These women co-operated in the Read form of suggestive technique, which is not true hypnosis, although it is closely related to hypnosis. Within three years, one of these women had committed suicide, the marriage of one had terminated in divorce and the third was suffering from severe neurodermatitis. The significance of the hypnotic experience in these subsequent events can only be conjectural. It appears likely, however, that a

tenuous psychologic hold was present in these three women which may well have been important in stimulating them to submit to natural childbirth, that their dependence on the obstetrician in this setting permitted temporary obedience to suggestion but that overwhelming anxiety developed when the dependency relationship was terminated as the postpartum period passed. These are instances of reactions following a light suggestive state. The inherent dangers of a state of deep trance are much greater, because the patient is less able to test reality, and the transference relationship between physician and patient is highly significant, activating many unconscious conflicts.

For the sake of completeness, I would add a note of warning. Hypnosis never should be used in the treatment of pseudocyesis or postpartum psychosis. Such a practice has led only to dire results.

Summary

Hypnosis is an effective analgesic. It remains a potentially "toxic" agent, however, unless its use is controlled by psychodynamic principles. It should be considered as an adjunctive obstetric analgesic and may be the analgesic of choice in selected cases. It can be of exceptional value in the treatment of oligolactia, hyperemesis gravidarum, heartburn and threatened abortion. Its effectiveness is a reflection of its potential "toxicity" when ineptly handled.

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INSURANCE FOR ATOMIC ENERGY WORKERS

Of the more than 150,000 people employed in atomic energy plants throughout the United States, at least 99.7 per cent are now considered as standard risks for life insurance, requiring no extra premium due to any atomic hazard, the Institute of Life Insurance reports.

A coding system has been set up for all workers in nuclear energy plants. Each job has a coding-number, giving the measure of risk applying to that job. The coding-number for a worker is then made available to any life insurance company which has received an application from that worker for insurance. A rating of persons in these occupations is thus made possible without reference to information classified for security reasons.

All but a few hundred of the 150,000 atomic workers

are now standard-rated, insofar as the atomic risk is concerned. The small percentage for whom an extra rate is required, includes areas of certain nuclear reactivity or special research. During the war, all atomic workers, then mystery men, if insured at all, were usually charged an extra premium, running as high as \$10 per \$1,000 of life insurance.

Safety controls have come rapidly in this infant "industry," evidenced by resurveys of accident rates in many of the plants. Both frequency and severity of accidents in nuclear energy plants have dropped to one-fifth or one-sixth of the rates of 1943. It has been found that "A"-plant workers today have accident frequency and severity rates well below those in the petroleum industry or the chemical industry, for example.

Clinical Experience with Metaraminol

in the Treatment of Shock

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THE CLINICAL value of potent vasopressor agents in the treatment of shock has been widely recognized. This has led to their successful application and increasing use in various hypotensive states, particularly in shock related to myocardial infarction and shock due to overwhelming infections. This paper summarizes the results obtained with metaraminol* (aramine), an agent closely related to, but in our experience, more satisfactory than norepinephrine (levophed).

Hypotension most frequently results from loss of effective blood volume, which itself is caused by hemorrhage, pooling of blood in dilated vascular beds, or dehydration. Return of blood to the heart becomes inadequate, cardiac output is decreased, and the blood pressure falls. This leads to further pooling and to a further decrease in venous return and thus a vicious circle results. At the same time the fall in arterial pressure leads to a reduction in coronary blood flow which subsequently causes defective myocardial contractility and a still further decline in cardiac output. Indeed, two vicious circles are established and these reinforce each other (Fig. 1).

Vasopressor agents like norepinephrine and metaraminol are effective in the treatment of shock because they control these progressive changes. It is well known that these drugs elevate blood pressure by constricting arterioles, but their therapeutic value has been closely related to at least two additional effects. In studies with dogs, we¹ recently demonstrated that the shock produced by Gram-negative bacteria is caused initially by pooling of large quantities of blood in the portal venous system, and that administra-

tion of metaraminol promptly remedied this pooling, with consequent increase in venous return. The studies of Gazes and Cotten and their associates^{2,3} with norepinephrine and the studies

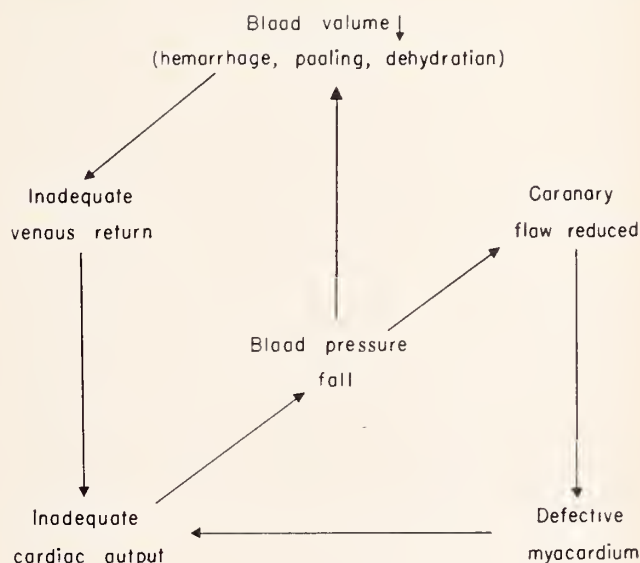


Fig. 1. Pattern of the circulatory failure which initiates and propagates shock.

of Sarnoff, Case and their co-workers^{4,5} with metaraminol indicated that the beneficial effects of these drugs also are due in part to direct action on the myocardium producing increased myocardial contractility.

The chemical structure of metaraminol closely resembles that of both epinephrine and norepinephrine (Fig. 2). However, the pharmacologic actions of metaraminol are primarily like those of norepinephrine; and cardiac acceleration, stimulation of the central nervous system, or depression of appetite are not observed after administration of metaraminol.

Norepinephrine has the unfortunate disadvantage of injuring tissue at the site of injection. Even the use of a polyethylene catheter advanced well into the vein does not offer assurance against tissue necrosis and thrombophlebitis. Deep ulceration which involves the skin and subcutaneous

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* Supplied as metaraminol bitartrate ("aramine" bitartrate) by Merck Sharp & Dohme Research Laboratories, West Point, Pennsylvania.

tissues has been disturbingly common, and has required subsequent skin grafting and even amputation.^{6,7} Other undesirable features of norepinephrine include the transiency of its action,

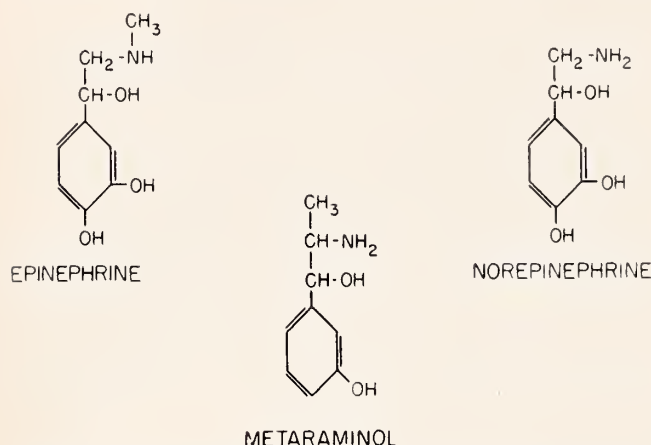


Fig. 2. The chemical structures of epinephrine, norepinephrine and metaraminol.

which necessitates administration under constant nursing supervision, and the need of large quantities of fluid vehicle when this may be undesirable because of inadequate excretion of urine. Preliminary results with metaraminol suggested that with this drug these disadvantages could be overcome and the desired therapeutic actions of norepinephrine retained.

To evaluate metaraminol clinically we studied the effect of it on thirty-one normotensive volunteers.⁸ We found that injection of undiluted drug by the intravenous, intramuscular, or subcutaneous routes was effective and never caused local injury to tissue. On intravenous administration the pressor effect became manifest in one to two minutes, was maximal in five minutes, and persisted for twenty to twenty-five minutes. On intramuscular or subcutaneous administration, a pressor response became manifest after five to twelve minutes and maximal elevation occurred at approximately thirty minutes. The action of the intramuscular dose persisted for only fifty minutes, but the action of the subcutaneous dose continued ninety minutes. For this reason, the subcutaneous route was favored in the treatment of many patients.

Subsequent studies, already published, involved forty-two patients with profound shock of four or more hours' duration.⁹ In most cases the shock was associated with myocardial infarction or caused by overwhelming infection. Administra-

tion of metaraminol was followed by prompt elevation of blood pressure from an average level of 68 mm. of mercury systolic and 57 diastolic to 120 systolic and 76 diastolic in thirty-six of the patients. The blood pressure was well supported for four or more hours in thirty-two patients, and twenty-eight patients initially recovered from the shock state. Despite this recovery from shock by 66.6 per cent of the patients, only 38.1 per cent (sixteen of the forty-two) ultimately survived their underlying illnesses—but this reflects the seriousness of their primary condition. The results with metaraminol are, as far as comparisons are possible, at least as satisfactory as those achieved with norepinephrine.¹⁰⁻¹²

Treatment with metaraminol often was started with a single intravenous injection of 3 to 15 mg. which produced a prompt elevation of blood pressure. When the peripheral veins were collapsed, the agent was injected directly into the femoral vein, whereupon the blood pressure was elevated and the peripheral veins usually became more normally distended. An intravenous infusion then could be started without difficulty, and a time-consuming and traumatic cutdown procedure thus avoided. In most patients the blood pressure was well maintained by doses of 3 to 25 mg. of metaraminol given subcutaneously and repeated every one-half to two hours. In patients who responded poorly, a continuous intravenous infusion of metaraminol in a dosage up to 200 mg. per liter of fluid was administered. After satisfactory control had been achieved, the subcutaneous route was preferred.

Metaraminol has since been employed by us in the treatment of more than 500 patients. The ease with which it can be given has encouraged its prompt use in shock. The value of this drug was particularly apparent among patients suffering from shock after myocardial infarction and among patients with bacteremia who required vasopressor support for many days. The use of subcutaneous injections at hourly intervals replaced the norepinephrine infusion. Skin necrosis, thrombophlebitis, or serious toxic side effects did not occur in this large group. The pressor effect of metaraminol has been remarkably easy to control and no decrease of response has followed its use for periods sometimes exceeding three weeks.

At times norepinephrine produces a pressor response when metaraminol fails to do so. However,

no patient of ours who clearly failed to respond to therapy with metaraminol ultimately survived in spite of prompt treatment with norepinephrine. A parallel observation was made recently by Stechel and his associates.¹³

In summary, metaraminol was found to be therapeutically effective, simple to administer without risk of injury to skin and subcutaneous tissues, and available for injection without additional fluid (thus especially suitable for patients with renal failure). These features make it a much more desirable drug than pressor amines previously available for the treatment of patients in shock.

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Maternal Causes in the Etiology of Neonatal Pulmonary Disease

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THE PURPOSE of this study is to show, if possible, that there is a correlation between fetal distress and respiratory difficulty of the newborn infant. It is not uncommon that an abnormal delivery is followed by cyanosis, retractions, and grunting respirations of the newborn. This may be a coincidence, but if there is a causal relationship, such knowledge would be of importance in the management of labor and the treatment of the newborn infant.

Method of Study

We reviewed 1,000 infants born consecutively at Fairview Hospital in Minneapolis. A record was kept in the nursery listing each abnormal infant. The patient's chart was then reviewed and included in the study if the anomaly was obvious, such as prematurity, congenital malformation, or if the record indicated that the child had unquestionable pathology. Thus a short transitory attack of cyanosis or retractions was omitted, but if there was more than one definite symptom, or the child received treatment, or was diagnosed as having atelectasis by the physician, the case was included. We then carefully reviewed the birth record of each ill child; we checked mainly for Caesarean section, prolonged labor, precipitate delivery, rapid labor in primiparas, meconium stained amniotic fluid, or a drop in fetal heart rate. We noted whenever Pitocin was used to induce or hasten delivery, since we had seen some atelectatic babies after the use of the drug.

Results

Of the 1,000 newborn, fifteen died due to the usual causes of neonatal mortality (Table I). There were ten stillborn infants during this period. One hundred and four of the 1,000 newborns presented some major symptom of illness, or prematurity and recovered.

This paper was presented at the fall meeting of the Northwestern Pediatric Society in Bayport, Minnesota, Friday, Sept. 28, 1956.

We were particularly interested in the thirty-seven full-term babies and four of the larger premature babies who had respiratory symptoms. In this group were twenty-eight infants whose symp-

TABLE I. NEONATAL MORBIDITY AND MORTALITY OF 1,000 NEWBORNS

	Survived	Died
Premature	40	9
Prematurity only Dx	35	6
Prematurity and pulmonary disease	5	2
Prematurity and intracranial hemorrhage	—	1
Full Term	64	6
Respiratory symptoms	37	1
Birth injury	8	2
Erythroblastosis	8	1
Congenital Anomalies	7	2
Others	4	—
	104	15

toms, physical findings, and x-rays (when available) were conclusive enough to allow a diagnosis of "pulmonary atelectasis." The other thirteen infants showed cyanosis, or some respiratory distress, such as grunting, excessive mucus, or difficulty in resuscitation, severe enough to warrant concern at the time. When we reviewed the birth record in each of these, we found in the majority of the cases some condition during the delivery which might have caused fetal distress.

TABLE II. POSSIBLE MATERNAL FACTORS IN 28 NEWBORNS WITH ATELECTASIS

Precipitate labor	4)	
Rapid labor	6)	10
Pitocin I.V. or I.M.		10
Caesarean section	1)	
Difficult delivery	1)	
Fetal distress	3)	5
Apparently normal delivery		3
		28

Of these twenty-eight newborns, two-thirds had either rapid labor or Pitocin, five had some sort of difficulty during delivery, three seemed normal. The precipitate labors were usually quite obvious. Under the rapid labors we included cases, such as a four-hour labor in a primipara, a six-hour fifty minutes labor in a thirty-eight-year-old primipara, an "unsterile delivery," and those cases in which the physician remarked on the rapidity of the

delivery. The cases with fetal distress showed meconium stained amniotic fluid, or a drop in fetal heart rate.

When we included the other thirteen cases with respiratory symptoms but not typical of "pulmonary atelectasis," the maternal picture did not materially change. (Table III)

TABLE III. POSSIBLE MATERNAL FACTORS IN 41 NEWBORNS WITH RESPIRATORY SYMPTOMS

Precipitate labor	5)	
Rapid labor	7)	12
Pitocin I.V. or I.M.		13
Caesarean section	2)	
Difficult delivery	1)	
Fetal distress	4)	
Cord tightly around neck	2)	9
Apparently normal delivery		7
		41

These so-called normal deliveries include three cases in which mother and infant might have been oversedated, but, since this is difficult to assess from the chart, they were classified as normal.

Discussion

Prolonged, difficult labor has long been recognized to be a cause of fetal distress. It seems that abnormally short labor may similarly traumatize the infant.¹ A severe prolonged uterine contraction often causes a drop in fetal heart rate. Such a contraction, forcing the head rapidly into or through a poorly dilated birth canal, may well cause cerebral edema. This may be the case in a precipitate labor or any abnormally fast labor. Pitocin can cause violent and prolonged uterine contractions. It may well be a safe drug for the mother, but the question must be raised whether it is safe for the fetus.

Pitocin is used quite often to induce or hasten labor. In 129 of the 1,000 infants studied, the mother had received the drug. In thirteen of the forty-one newborns with respiratory difficulties, or ten of the twenty-eight with atelectasis, Pitocin was used. This represents a third of all the patients with respiratory distress. It seems not unlikely that the use of Pitocin creates a similar situation and hazard to the newborn to that of rapid labor.

Are we justified in considering these cases of diverse pulmonary symptoms as one entity, the so-called "pulmonary atelectasis," and assume that it is likely to follow fetal distress? Our series, though admittedly small, seems to suggest this. Other conditions with respiratory symptoms—such as pulmonary hyaline membrane disease,² congen-

ital pneumonia, lung cysts, diaphragmatic hernia, tracheo-esophageal fistula, septicemia, major cardiac malformations—are either so rare in babies who survive or so obvious that they would have been diagnosed.

The initiation and maintenance of respiration are a function of the central nervous system. If a newborn does not start breathing, the difficulty cannot possibly be due to an obstruction or a pulmonary lesion; it must be central. Cerebral edema, or hemorrhage, often manifests itself in pulmonary symptoms.^{3,4} The respiratory symptoms of our cases were probably due to involvement of the central nervous system caused by fetal distress or more specifically fetal anoxia.

Conclusion

A newborn who had difficulty during the delivery is far more likely to develop respiratory difficulty than a child following a normal delivery. There is evidence that rapid labor, the so-called "tumultuous labor," and the use of Pitocin substantially contribute to neonatal respiratory disease.

This would lead us to the following suggestions in the management of labor and of the newborn:

1. Avoid drugs which might lead to precipitate labor or abnormal uterine contractions.
2. Discourage the traditional hanging the newborn by its feet and slapping it to initiate breathing.
3. Emphasize extreme gentleness, especially in handling the sick newborn.
4. Reevaluate the need for the customary Trendelenburg position for the baby with respiratory distress.
5. During the time when the child is recovering from the cerebral insult, provide oxygen as needed have the atmosphere well humidified, and give antibiotics to guard against pneumonia.

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The Interpretation of Thyroid Function Tests in the Diagnosis of Thyroid Disease

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THE diagnosis of thyroid disease is still made primarily on clinical findings. Laboratory tests of thyroid function supplement and corroborate the impression of the clinician, but are never a substitute for careful and critical evaluation of the patient. Complete reliance cannot be placed on any single laboratory measure, and, in difficult diagnostic problem cases, a battery of thyroid function tests along with the clinical findings is usually necessary to arrive at a correct diagnosis.

The search for more sensitive and exact laboratory measures of thyroid function continues to interest many investigators in both basic and clinical endocrinology. It is estimated that in the past decade over 7800 papers on the thyroid gland have been published in the World medical literature.¹ Much of this impetus for research in thyroid disease has come with the availability of radioactive iodine, although the initial enthusiasm over radioiodine as a diagnostic tool has been tempered with greater experience. The present paper is a survey of the currently available tests of thyroid function and their value and interpretation in the diagnosis of thyroid disease.

Physiologic Considerations

Familiarity with the physiology of the thyroid gland is essential to an understanding of the laboratory measures of thyroid function and their interpretation and alteration in disease. For purposes of simplicity, thyroid physiology may be divided into the metabolism of iodine, the nature of thyroid hormone, and the degradation of thyroid hormone.

Iodine Metabolism.—Accumulation of iodide by the thyroid is an integral part of the synthesis of

thyroid hormone. Marine and Feiss² first demonstrated in perfusion experiments that thyroid was the only tissue that concentrated significant amounts of iodine. In autopsy studies on patients receiving radioiodine before death, it has been shown that significant quantities of iodine are found only in the thyroid and the urine.^{3,4} The thyroid to serum iodide ratio is normally about 50:1, and ratios of 500:1 may be found in hyperthyroidism and after thyrotropin administration.^{5,6} The average daily diet contains about 125 mcg. of iodine, and approximately 115 mcg. is excreted each day in the urine. The thyroid gland concentrates about 75 mcg. of iodine from the plasma daily, and roughly the same amount is secreted each day as thyroid hormone.^{1,7} These values indicate the high degree of efficiency and the minute quantities involved in the body's handling of iodine.

The thyroid continuously extracts its requirements of iodine from the plasma as iodide. The thyroid trapping mechanism has been studied by means of antithyroid drugs, such as propylthiouracil, which block thyroid hormone synthesis.^{8,11} It has been thus established that thyroid tissue will continue to concentrate iodide from the plasma, although the accumulated iodide cannot be synthesized into hormone. Trapped iodide in the blocked thyroid is freely exchangeable with iodide of plasma and can be displaced from the thyroid by thiocyanate, perchlorate, nitrate, and stable iodide. Despite the freely exchangeable character of thyroidal iodide, the concentration of iodide in the thyroid can be maintained at many times the plasma level. The exact mechanism of thyroidal iodide trapping is not known. The iodide trapping capacity of thyroid cells may be due to loose protein bonding between iodide and components of the thyroid cells, from which the iodide is readily dissociable.¹² In the unblocked gland, iodide is rapidly incorporated into amino acid-protein com-

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plexes and is no longer exchangeable. About 10 per cent of the thyroid iodine is in the form of iodide, the remainder being organically bound.

Figure 1 schematically illustrates the metabolic

Nature of Thyroid Hormone.—Until about ten years ago, it was generally accepted that only two iodinated compounds were synthesized by the thyroid, thyroxine, the active hormone, and

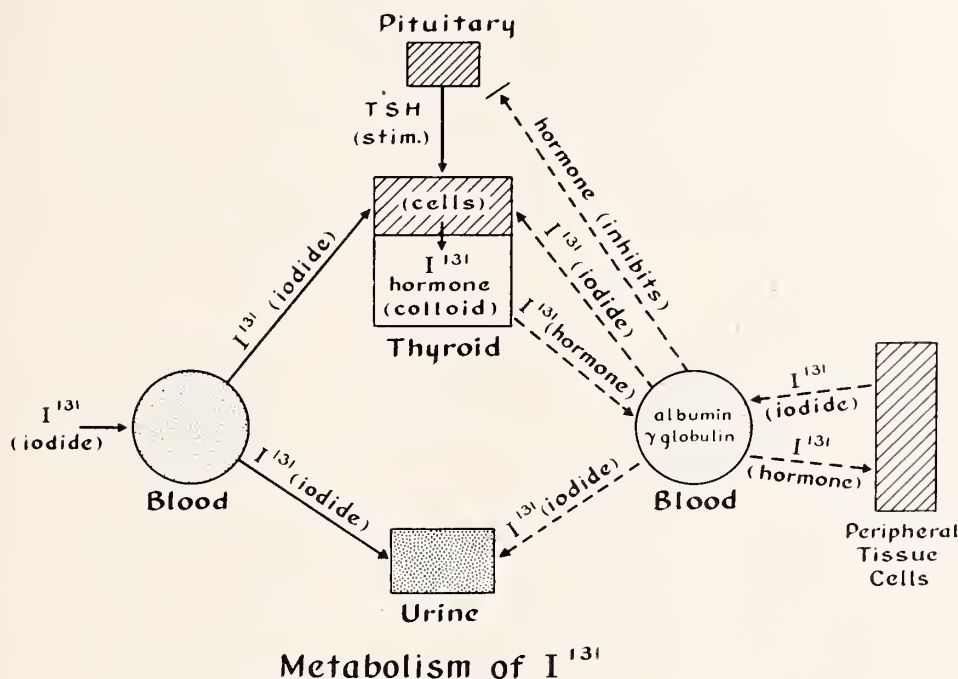


Fig. 1. The metabolism of iodine as indicated by radioactive iodine.

cycle of iodine as studied with radioiodine. The quantity of iodide extracted by the thyroid from the plasma varies with the functional state of the gland, being high in hyperthyroidism and low in myxedema. The kidneys are the only competitor for iodide; however, the renal iodide clearance rate remains approximately the same regardless of the functional state of the thyroid, averaging about 35 ml. plasma cleared of iodide per minute.¹³ Negligible amounts of iodide are excreted in sweat, saliva, and feces. Iodide is distributed and in equilibrium throughout the body fluids, constituting the "iodide pool." The plasma iodide level is maintained exogenously from food intake and endogenously by degradation of thyroid hormone with release of iodide.

Thyrotropin (TSH) released by the anterior pituitary has a stimulatory effect on the thyroid. Within two hours after administration of TSH there is an increase in serum thyroid hormone levels, and within eight hours there is an increased thyroid uptake of radioiodine.⁶ It is thought that release of TSH is inhibited by thyroid hormone, so that a reciprocal balance exists in the normal human, however, direct evidence for this is lacking.

3-5 di-iodotyrosine, its precursor, both compounds stored as thyroglobulin in the colloid of the thyroid follicles. It is now known that thyroglobulin contains at least two iodinated tyrosines and four iodinated thyronines, and other as yet unidentified iodinated amino acids.¹⁴ It has been established that there are at least three other biologically active iodinated compounds in plasma, in addition to thyroxine. The identification of 3,5,3'-tri-iodothyronine in plasma, thyroid, and other tissues by Gross and Pitt-Rivers¹⁵ has activated a complete re-evaluation of the action of thyroid hormone. 3,5,3'-tri-iodothyronine has been shown to have 3 to 5 times the biologic activity of thyroxine. 3,3'-di-iodothyronine and 3,3',5'-tri-iodothyronine, the other known active hormones in plasma, have approximately 80 per cent and 5 per cent the activity of thyroxine.

Evidence has now accumulated to indicate that the biologically active iodothyronines are synthesized from monoiodotyrosine and di-iodotyrosine. The compounds are then bound to protein, forming thyroglobulin, a glycoprotein of estimated 680,000 molecular weight. Thyroglobulin, which is non diffusible, is stored as colloid in the thyroid follicles. Through enzymic

proteolysis, the active hormones are released from thyroglobulin into the plasma, and the iodo-tyrosines remain in the thyroid where they are reutilized. Thyroglobulin as such is not found in plasma except in certain abnormal states such as radiation or surgical injury to the thyroid. The plasma iodine is composed of 10 to 20 per cent inorganic iodide, 70 per cent thyroxine, and the remainder, other iodinated thyronines including 3,5,3'tri-iodothyronine.^{15,16} The thyroid hormones circulate loosely bound to plasma proteins, mainly albumin and alpha globulin.

Degradation of Thyroid Hormone.—There is much speculation at present that tri-iodothyronine is the active tissue form of thyroxine. After the injection of I¹³¹ labeled thyroxine into athyreotic human subjects, labeled tri-iodothyronine appears in the plasma.¹⁷ It has been shown that thyroxine is deiodinated to tri-iodothyronine by rat kidney slices.¹⁸ Administered thyroxine has a peak biologic effect in four to five days and a metabolic half-life of about twelve days, whereas tri-iodothyronine is biologically active and completely metabolized within hours of administration. Myxedematous patients can be maintained in the euthyroid state with tri-iodothyronine. One factor in the more rapid action of tri-iodothyronine may be its looser binding to protein and thus its more rapid diffusion into tissues.¹⁹ There is no question that thyroxine and 3,5,3'tri-iodothyronine are both metabolically active hormones, but whether the latter and the other known active iodothyronines are derivatives of thyroxine cannot be answered at present. Inorganic iodide released into the plasma following the degradation of these compounds is utilized again in the iodine metabolic cycle for synthesis of thyroid hormone.

Thyroid Function Tests

Basal Metabolic Rate.—The rate of heat production by the body under basal conditions (relaxed and awake after a twelve-hour fast) has been termed the basal metabolic rate (BMR). Clinically the BMR is determined by measuring the rate of oxygen consumption from the lungs and indirectly calculating the rate of heat production. Under basal conditions, assuming the RQ (respiratory quotient) to be 0.82, the consumption of one liter of oxygen produces 4.825 calories. The hourly heat production per square meter of body surface can thus be calculated. The

TABLE I. FACTORS INFLUENCING BASAL METABOLIC RATE

1. Technical—O₂ leak, airway block, perforated ear drum
2. Food intake within 12 hours.
3. Smoking—raises BMR 5-10 per cent.
4. Poor rest, anxiety, irregular respiration.
5. Fever—10% rise per 1 degree temperature.
6. Age—8% decrease between age 30 and 60.
7. Voluntary alteration of respiration (—30 to +90).
8. Extra-thyroid disease: Lymphoma, acromegaly, heart failure, pulmonary disease, pheochromocytoma, polycythemia, hypertension, Parkinsonism, chorea, anorexia nervosa, starvation, obesity, Addison's disease.

average normal male under basal conditions produces 39.5 cal./sq. M./hr., and a female produces 36.5 cal./sq. M./hr. The BMR is expressed as the plus or minus per cent deviation from these normal standards.

The BMR reflects the rate of oxygen consumption of tissue cells, which is in part regulated by thyroid hormone. It is apparent that a great many other extra-thyroidal factors can effect pulmonary and tissue oxygen consumption. The more important of these factors are listed in Table I. Technical errors such as a loss of oxygen through a leak in the apparatus or a perforated ear drum, or anoxia produced by a faulty airway can markedly alter the BMR. The most common causes of alteration of the BMR are violations of the basal conditions. Food intake within twelve hours, lack of rest, anxiety, irregular respiration, smoking, and fever all cause elevation of the BMR. A healthy trained subject can so alter the position of his respiratory cage that BMR values from —30 per cent to +90 per cent may be produced at will, and with an apparently faultless spiogram tracing.¹ This experiment is simulated by the nervous, tense patient. Many diseases may alter the BMR unrelated to any thyroid function abnormality. The BMR cannot be interpreted accurately without knowledge of the conditions under which the test was performed and associated diseases of the patient.

Two variations of the standard BMR test have been used. An afternoon test has been studied in a small group of patients and apparently yields results comparable to the early morning test.¹ The patient has a light carbohydrate breakfast, does not smoke or eat after 11:00 a.m., and rests as much as possible until the BMR is determined at 1:00 p.m. Its only advantage is that of convenience. The somnolent BMR, performed with the patient under heavy barbiturate sedation has been used

to eliminate the effect of anxiety and nervous influences on the BMR.²⁰ This test is not without danger and results in no better separation of normal and abnormal thyroid function. Its use in an occasional extremely agitated patient may be warranted. However, other more reliable tests of thyroid function not influenced by nervous factors are available.

Approximately 75 per cent of normal persons will have BMR values between +10 and -10 per cent. To include 90 per cent of normal persons, the range of normal BMR must be extended to +20 to -20 per cent.

Serum Cholesterol.—It has been demonstrated that the rates of synthesis, destruction, and excretion of cholesterol are accelerated by thyroid hormone. Cholesterol synthesis is mainly in the liver. It is secreted by the liver directly into the blood and with the bile into the intestine where absorption into the blood occurs. Destruction and excretion of cholesterol is by the liver and intestine. Studies by Rosenman and associates²¹ indicate that the hyperthyroid state is associated with a markedly increased rate of hepatic synthesis, destruction and intestinal excretion of cholesterol, and the opposite occurs in hypothyroidism. The low serum cholesterol in hyperthyroidism is then presumably due to a relatively greater increase in the rate of destruction, and excretion of cholesterol as compared to the increase in the rate of hepatic synthesis. The hypercholesterolemia of myxedema is due to a relatively greater decrease in the rate of destruction and excretion. Myxedema is associated with hyperlipemia rather than just hypercholesterolemia. Free and esterified cholesterol, and phospholipids are increased, but neutral fat in the serum is not elevated.²²

Creatine Tolerance.—Ninety-eight per cent of the 120 gm. of creatine in the body is found in muscles, mainly as phosphocreatine. Creatinine is a product of creatine metabolism, excreted almost entirely in the urine. Creatine is usually not found in the urine of normal adult men, but is occasionally present in the urine of normal women. Creatine is almost always present in the urine of pregnant women, and children before puberty. Creatinuria may occur also in both sexes associated with high protein intake, starvation, carbo-

hydrate deprivation, severe diabetes, cachexia, poliomyelitis and certain muscular dystrophies.

Spontaneous creatinuria occurs in most patients with hyperthyroidism.^{23,24} An increased creatine tolerance has been noted in myxedema,²³ and the normal creatinuria of childhood may not occur in cretins. A decreased urinary output of creatinine is usually associated with the creatinuria of hyperthyroidism. Creatinuria in hyperthyroidism is probably due to the decreased capacity of damaged muscles to withdraw from the blood the creatine constantly formed in the body, and incorporate it into its creatine and phosphocreatine stores. As a result the blood creatine level exceeds the resorptive capacity of the kidney for creatine, and creatine appears in the urine. The decreased output of creatinine is due to the depletion of muscle creatine stores.

Shorr and associates²⁴ have devised a creatine tolerance test for the diagnosis of hyperthyroidism. The patient is placed on a creatine-creatinine free diet, and on the second day a twenty-four-hour urine specimen is analyzed for creatine and creatinine. On the third day 1.32 gm. creatine hydrate in 180 ml. water is administered orally, and a twenty-four-hour urine specimen again collected, and analyzed for creatine and creatinine. Normal persons retain 70 per cent of the administered creatine, hyperthyroid patients retain less. The creatine index, which is the ratio of twenty-four-hour urinary creatinine excretion in mg. to the body weight in kgm., is also lowered in hyperthyroidism. The index is twenty to twenty-eight in normal men and fourteen to twenty in normal women. Administration of iodine, even in small quantities, will abolish creatinuria, restore a normal creatine tolerance test, and eventually return the creatinine index to normal.²⁴

Serum Chemical Protein-bound Iodine.—As discussed earlier, thyroid hormone circulates loosely bound to the serum proteins, and can be measured in the blood as protein-bound iodine. The serum chemical protein-bound iodine (PBI) can be determined by distillation or alkalinicineration methods.²⁵ The techniques in general involve the precipitation of the serum proteins, digestion of the organic material and conversion of the iodine to an oxidized form, distillation or extraction of the iodine, and finally measurement of the iodine as iodide after reduction. The amount of iodide present is determined colori-

metrically by its catalytic effect on the rate of conversion of ceric sulfate (yellow) to cerous sulfate (colorless). The quantities of iodine involved are minute and great care must be taken in all phases of the determination to avoid losses or contamination with iodine. Much of the lack of confidence of many clinicians in this test can be attributed to attempts to interpret results obtained by careless technicians. Carefully performed, the serum PBI determination is a sensitive and useful measurement of thyroid function.

The normal range of serum PBI is 3 to 8 mcg. per cent. In a study of 404 normal men, 90 per cent had values between 4 and 7 mcg. per cent, 0.5 per cent had values below 3 mcg. per cent and 7 per cent had values above 8 mcg. per cent.²⁶ The mean value for a group of fifty euthyroid subjects was 5.4 mcg. per cent.²⁷ The serum PBI is frequently moderately elevated during pregnancy, gradually returning to normal after delivery.^{28,29} There is some decrease in the PBI with age.²⁶ High values have been reported to occur early in the course of infectious hepatitis.³⁰ Low PBI values occur in the nephrotic syndrome, hepatic cirrhosis, and starvation. Administration of iodine containing x-ray contrast material, iodides and thyroid extract produce elevation of the PBI. The rate at which these compounds are metabolized and excreted determines the time necessary before the test is again reliable. This will be discussed further in the section on radioiodine. Administration of tri-iodothyronine does not elevate the PBI. Exogenous and endogenous thyroid hormone are not differentiated by the methods. Mercurial diuretics will produce falsely low PBI values if acid-ash distillation methods are used, since iodine will be precipitated by the mercury during digestion and will not be distilled over and measured.³¹ The effect of mercurial diuretics on the PBI is usually dissipated within twenty-four to forty-eight hours.

Radioiodine Tests.—Radioactive iodine is chemically and biologically interchangeable with stable iodine (I^{127}), their only difference being physical. Since radioiodine emits penetrating gamma and short range beta radiation, it is possible to trace and measure it through complicated systems and in organs, blood, and urine by means of sensitive radiation measuring devices. Although fourteen radioisotopes of iodine have

TABLE II. MEASUREMENT OF THYROID FUNCTION WITH RADIOACTIVE IODINE

1. Thyroid uptake of I^{131}	
2. Urine excretion of I^{131}	
3. Thyroid clearance: % of dose collected by thyroid per hour	
Aver. plasma I^{131} conc. in % of dose × 60	= cc. of plasma cleared of iodide per minute
4. Rate of thyroid uptake: $C(t) = C_m (1 - e^{-kt})$ $C(t)$ — thyroid uptake at any time t C_m — maximum thyroid uptake k — rate constant	
5. Accumulation gradient	
6. Total plasma I^{131} level at 24 hours	
7. Per cent of plasma I^{131} protein-bound at 24 hours	
8. Plasma conversion ratio at 24 hours Protein-bound I^{131}	× 100
Total plasma I^{131}	
9. Neck to thigh ratio	

been identified, only one, I^{131} , is in general use in clinical medicine, primarily because of its favorable decay rate (half-life eight days). I^{131} is usually administered carrier free, so that one millicurie of I^{131} is equivalent to only 0.008 mcg. of stable iodine. Thus I^{131} can be utilized as a test indicator of I^{127} metabolism without producing any pharmacologic effect. With scintillation radiation counters, tracer doses as small as one microcurie can be used and significant irradiation does not occur.

Radioiodine tests basically all measure either the rate of thyroid I^{131} accumulation, or the rate of appearance of administered I^{131} in the urine or the plasma. A variety of tests have been tried and discarded as insensitive or too complicated, and the thyroid I^{131} uptake has become the most generally used test. The various tests that have been proposed are listed in Table II. Oral tracer doses have been satisfactory for clinical use. The urinary excretion of I^{131} during the first twenty-four or forty-eight hours after a tracer dose was the first test widely used. It is a fairly accurate measure of thyroid function, since the urinary I^{131} excretion is inversely related to the uptake of I^{131} by the thyroid. Euthyroid persons excrete about 65 per cent of an administered I^{131} dose in twenty-four hours on the average, and seldom excrete less than 40 per cent. Hyperthyroid subjects usually excrete less than 30 per cent. Hypothyroid and euthyroid individuals overlap considerably in urinary I^{131} excretion and the test is less reliable. A delayed excretion of I^{131} between twenty-four and forty-eight hours occurs in

hypothyroidism and better separation of hypothyroid and normal persons is possible.³² Errors in collection of urine and unreliability of the test in the face of renal insufficiency and congestive

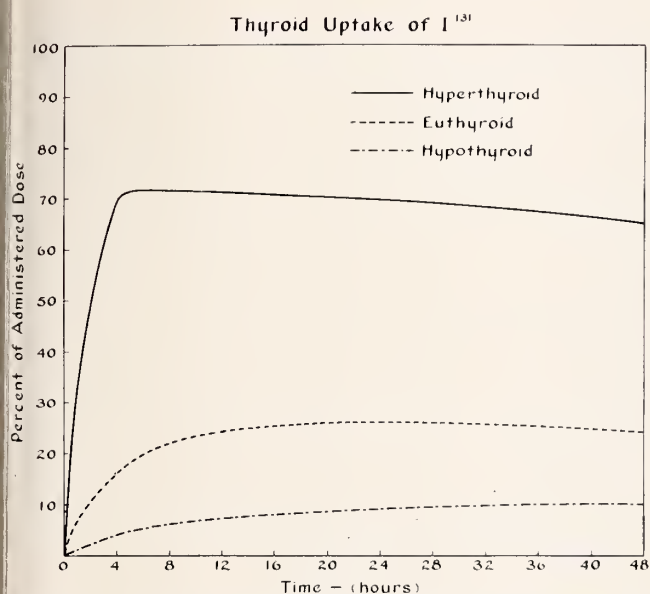


Fig. 2. Thyroid uptake of I^{131} at serial time intervals after an oral tracer dose.

heart failure has resulted in the replacement of this test by the direct measurement of thyroid I^{131} uptake.

Thyroid I^{131} uptake is the simplest of the radioiodine tests. At a variable time interval after an oral I^{131} tracer dose, usually twenty-four hours, the quantity of I^{131} accumulated by the thyroid gland is measured directly by means of an externally placed radiation counter, and the result expressed as the per cent of the administered dose taken up by the gland. The normally functioning thyroid will take up 15 to 50 per cent of the dose in twenty-four hours. In hyperthyroidism more than 50 per cent and in myxedema less than 15 per cent will be taken up. Studies of thyroid uptake within the first six hours after a tracer dose have demonstrated that good separation of normal and hyperthyroid subjects can be obtained.³³⁻³⁷ The upper limits of normal for thyroid uptake at one, two, and three hours after an oral tracer dose is 15, 20 and 25 per cent, respectively,³⁷ and at six hours is 25 per cent.³⁶ Curves of thyroid I^{131} uptake at various time intervals are shown in Figure 2, and indicate the effective separation of hyperthyroid, euthyroid, and hypothyroid groups.

In general, thyroid uptake is free of patient

induced errors; however, many drugs commonly used as medications or x-ray contrast materials, and certain non thyroid disease states will affect thyroid uptake and make the test unreliable. Iodides, in Lugol's solution, cough mixtures, and vitamin-mineral preparations, will depress thyroid uptake for seven to twenty-one days. Iodine-containing x-ray media for cholecystograms will depress thyroid uptake for three to six months, pyelograms for two to seven days, and bronchograms a year or more. The more recently available water soluble contrast materials used in pyelography and bronchography may depress uptake for only a few weeks or not at all. Iodized table salt does not affect uptake. The time necessary for the administered iodine to be metabolized and excreted determines how long the uptake will be affected. The length of time is considerably shortened in hyperthyroidism because of the greatly accelerated rate of iodine turn-over. The degree of uptake depression by antithyroid drugs, such as propylthiouracil, is related to the dosage administered. In hyperthyroidism, the uptake will return to the pretreatment level within seven days after the drug is discontinued.³⁸ While there is a measurable blood level of thiocyanate, the uptake will be depressed, but as the level falls, the uptake may rise into the hyperthyroid range as the hyperplastic iodine-poor gland soaks up iodine. This is the only drug which will produce an increased thyroid uptake. Butazolidin, PAS, ACTH, and cortisone all depress thyroid uptake for variable periods of time. Thyroid extract, thyroxine, and tri-iodothyronine depress thyroid uptake through inhibition of pituitary thyrotropin release. Usually thirty days is sufficient for recovery of uptake. A period of relative thyroid insufficiency follows thyroid hormone administration and moderate clinical hypothyroidism may occur lasting one to two months. The TSH test, which will be described later, can be used to differentiate primary myxedema and drug induced uptake depression, since the drug depressed gland can be stimulated to increase uptake. Iodine starvation, renal insufficiency, congestive heart failure, and large nontoxic goiters may be associated with moderate, but rarely marked elevation of thyroid uptake.

Many other methods for evaluation of thyroid function with I^{131} have been reported, but are more complicated, open to more error, and in general offer no advantage over thyroid uptake.

Thyroid I^{131} clearance, initially considered to be a more sensitive measure, has been shown to be no more effective than the simpler three or six-hour thyroid uptake.³⁶⁻³⁷ The rate of thyroid uptake and the thyroid accumulation gradient have been generally discarded for clinical use. The plasma conversion ratio and the rate of appearance of protein-bound or butanol-extractable (thyroxine) I^{131} in the plasma are considerably more complicated and less discriminative measures than thyroid uptake. They are worthless in the diagnosis of hypothyroidism. The total plasma I^{131} has almost no diagnostic effectiveness. The thyroid I^{131} uptake is the simplest and most diagnostically effective radioiodine test, and in further discussion of the thyroid function tests will be considered as representative of the radioiodine tests in general.

Interpretation of Thyroid Function Tests

Hyperthyroidism.—Many studies comparing the BMR and thyroid I^{131} uptake in the diagnosis of hyperthyroidism have been reported.^{7,32,36,40-42} It may be generalized that the thyroid uptake will be elevated in over 90 per cent of hyperthyroid subjects and the BMR in only 70 per cent. In a study of sixty-six hyperthyroid patients, almost all of whom had moderate or severe and only a few mild thyrotoxicosis, the BMR was +20 per cent or higher in 85 per cent.⁴⁰ However, 10 per cent of the patients had BMR values below +15 per cent and 8 per cent were below +10 per cent. Eighty-six per cent had twenty-four-hour thyroid I^{131} uptake values above 60 per cent, and in no case was the uptake below 50 per cent. The serum PBI was 9 mcg. per cent or more in the thirty-one patients tested. The serum cholesterol, although below 125 mg. per cent in 20 per cent, could not be considered of diagnostic value in individual patients. In a very comprehensive study of severe and borderline hyperthyroid patients, Skanse³² found the I^{131} tests abnormal in 98 per cent, the serum PBI in 93 per cent, and the BMR in only 78 per cent. In the cases of borderline hyperthyroidism, which were clinically difficult to diagnose, the I^{131} tests were abnormal in 95 per cent, the serum PBI in 86 per cent and the BMR in only 51 per cent. In a study of the discriminative effectiveness of the thyroid function tests in borderline hyperthyroidism, it was found that the thyroid I^{131} uptake most effectively separated euthyroid and hyperthyroid individuals

and the serum PBI was four-fifths and the BMR one-fifth as effective.⁴³ A weighted combination of the tests was only slightly more effective than the thyroid uptake alone. It is uncommon to find the thyroid uptake below 50 per cent in hyperthyroidism, although probably 5 to 10 per cent overlap between euthyroid and hyperthyroid subjects will occur in the range of 45 to 50 per cent uptake, and this range must be considered as borderline abnormal. Similarly, it is uncommon to find the serum PBI below 8 mcg. per cent in hyperthyroidism, however, the zone of 7 to 8 mcg. per cent must be considered borderline. Thyroid uptake at three hours after the tracer dose is more effective, both as to degree of separation and the amount of overlap, than uptake at twenty-four hours in hyperthyroidism.³⁷ Frequency distribution plots for thyroid uptake at one-half, one, two, three, and twenty-four hours in euthyroid and hyperthyroid subjects are shown in Figure 3. The more effective separation of the means for the two groups with uptake within three hours is particularly apparent in the plots.

The thyroid uptake is below 50 per cent more often in toxic nodular goiter than in diffuse toxic goiter, and occasionally when toxic nodular goiter is treated with iodine, the uptake may be markedly depressed for months despite continuing thyrotoxicosis. Following treatment of hyperthyroidism with radioiodine, the thyroid uptake is still a reliable, sensitive measure of the state of thyroid function.⁴⁰ In hyperthyroidism induced by thyroid hormone ingestion (thyrotoxicosis factitia), the BMR and serum PBI are elevated; however, the thyroid uptake is markedly depressed to myxedema levels.

Myxedema, Primary and Secondary.—The BMR is almost invariably below —20 per cent and usually below —30 per cent in frank myxedema. In milder degrees of hypothyroidism the BMR is more frequently in the low normal range. In frank clinical myxedema the thyroid I^{131} uptake at twenty-four hours is usually below 10 per cent and almost always below 15 per cent. Occasionally cases of undoubted myxedema are seen with uptakes between 15 to 20 per cent. It is very uncommon to find an uptake above 20 per cent in overt myxedema. Thyroid uptake within the first three hours after a tracer dose is much less effective than a twenty-four-hour uptake in the diagnosis of hypothyroidism. In

general, the BMR and thyroid I^{131} uptake are of equal effectiveness in the diagnosis of myxedema. The serum PBI, carefully performed, is a very

thyroidism cannot be answered. Unfortunately in milder degrees of hypothyroidism as in mild hyperthyroidism, all the thyroid function tests are

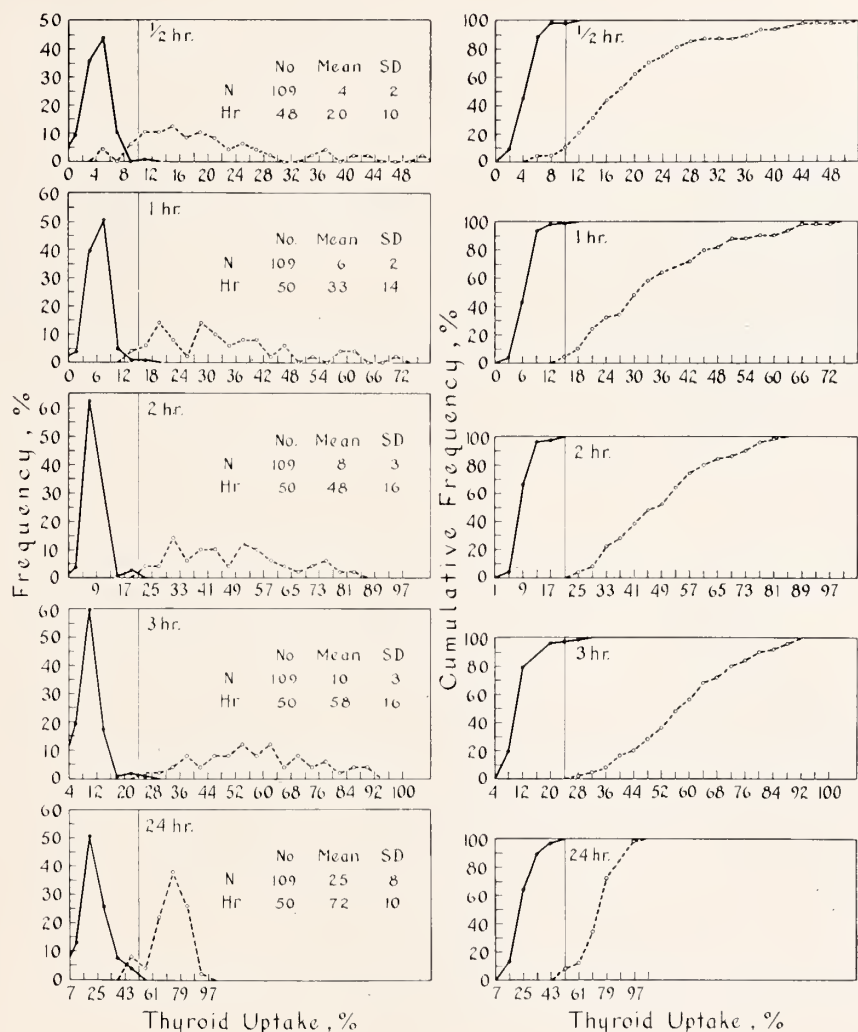


Fig. 3. Frequency distribution of thyroid I^{131} uptake at one-half, one, two, three and twenty-four hours after the tracer dose in euthyroid (N) and hyperthyroid (Hr) subjects. Solid lines indicate euthyroid, and broken line hyperthyroid.

sensitive measure of myxedema. Whereas in hyperthyroidism, the serum cholesterol is of little value in individual cases, in primary myxedema it usually is a valuable diagnostic aid. It is a particularly useful means of following the progress of a hypothyroid patient under treatment. The increase in serum cholesterol after treatment of hyperthyroidism with I^{131} , particularly in those patients who became hypothyroid is illustrated in Figure 4. In so-called hypometabolism without hypothyroidism the BMR is low and the thyroid uptake, serum PBI, and cholesterol are normal. The exact nature of this disorder awaits clarification, and whether it is a form of mild hypo-

frequently borderline and an absolute diagnosis is difficult to establish. The diagnosis of myxedema secondary to anterior pituitary failure is less effectively accomplished by thyroid function tests. The BMR and thyroid uptake are often less markedly depressed than in primary myxedema, and the serum PBI is commonly in the low normal range. The serum cholesterol does not become elevated in secondary myxedema. The differentiation of primary and secondary myxedema can be accomplished by means of the thyrotropin (TSH) test.⁴⁴⁻⁴⁷ A baseline thyroid I^{131} uptake is performed, following which 10 U.S.P. units of TSH is administered.

Twenty-four hours later the thyroid uptake is again determined. In primary myxedema no significant increase in uptake is elicited, whereas in normal persons and patients with secondary

response, and rarely, when irreversible atrophy of the thyroid has occurred, despite repeated stimulation with TSH, no response occurs. The TSH test does not distinguish a normal euthyroid sub-

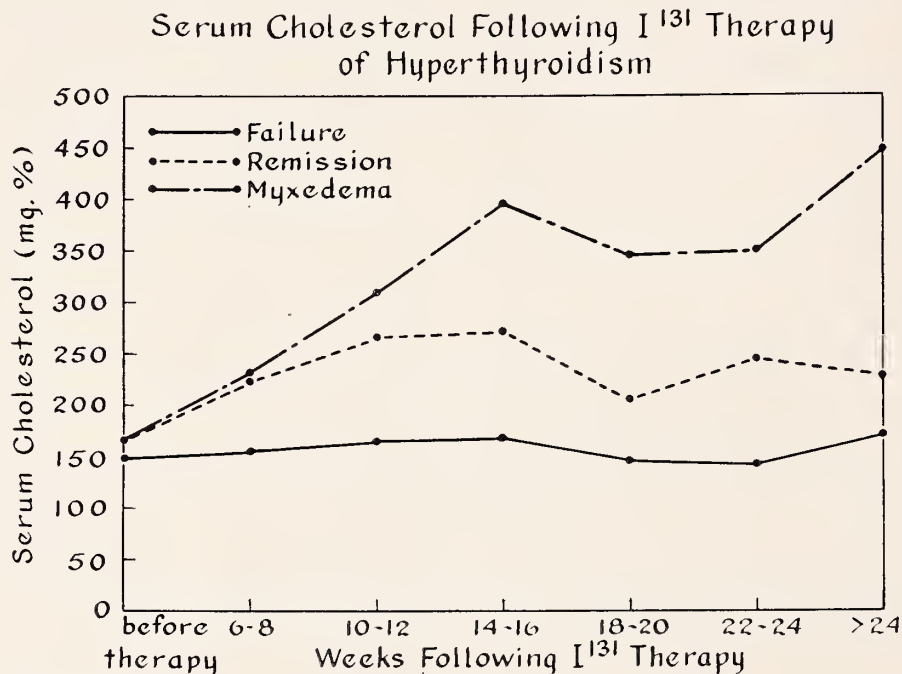


Fig. 4. Changes in serum cholesterol after I¹³¹ treatment of hyperthyroidism in patients who failed to respond, had a satisfactory remission, or became myxedematous.

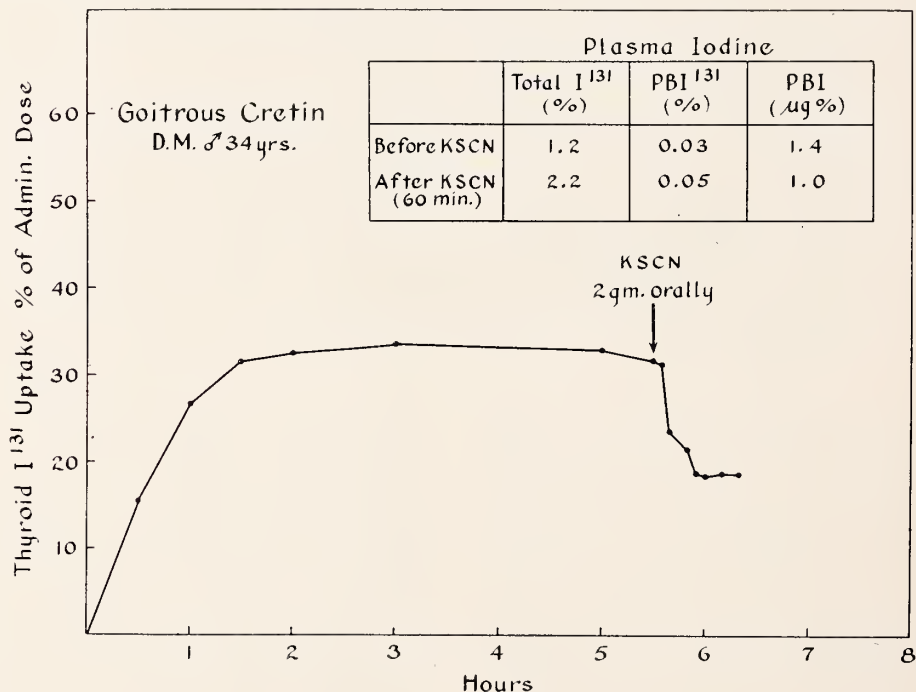


Fig. 5. The effect of thiocyanate on the accumulated I¹³¹ in the thyroid gland of a goitrous cretin.

myxedema, the uptake rises markedly. In some cases of long standing pituitary failure, two or three doses of TSH are necessary to obtain a

ject from a patient with secondary myxedema, since in both the uptake increases with TSH stimulation. The administration of thyroid hor-

none with resulting depression of uptake does not interfere with response to TSH stimulation.

Subacute Diffuse Thyroiditis.—The thyroid I^{131} uptake is markedly depressed during the active

indicating the iodine was still in the form of iodide and thyroid hormone was not being synthesized.

Benign Thyroid Nodules and Thyroid Carcinoma.—In nontoxic thyroid nodules, the tests of



Fig. 6. Scanogram of a benign diffuse toxic goiter.

phase of this disorder. During recovery the uptake gradually rises, although three to six months may be required for the uptake to return to normal. During the acute febrile stage, the BMR and serum PBI are commonly moderately elevated, and a clinical differentiation between thyroiditis and hyperthyroidism may be difficult. The finding of a very low thyroid uptake thus becomes very helpful. The low thyroid uptake of subacute thyroiditis does not rise with TSH stimulation.

Chronic Thyroiditis.—In chronic thyroiditis without myxedema, the tests of thyroid function are usually normal. A recent study of patients with chronic thyroiditis of the Hashimoto type indicated that the majority of these patients show laboratory evidence of primary thyroid failure, as reflected by low values for BMR and thyroid uptake, elevated serum cholesterol values, and decreased responses to TSH, although only a few have significant clinical myxedema.⁴⁸ In some cases of chronic thyroiditis with associated myxedema, the thyroid uptake is markedly elevated into the hyperthyroid range, although the BMR and serum PBI are low.⁴⁹ This same dissociation between iodine trapping and thyroid hormone synthesis is found in goitrous cretins.⁵⁰⁻⁵² The curve of thyroid I^{131} uptake in a goitrous cretin is shown in Figure 5. The three-hour thyroid uptake was in the hyperthyroid range, although the serum PBI was very low. The accumulated thyroid I^{131} could be discharged by thiocyanate without increasing the serum PBI,



Fig. 7. Scanogram of a goiter containing a solitary large benign adenoma in the upper pole of the right lobe.

thyroid function are usually normal. There is no test available which will differentiate a benign thyroid adenoma from a thyroid carcinoma. Radiation scanning devices which make radioautographs of the thyroid gland (scanograms) and manual differential counting of the gland have been utilized in an attempt to diagnose thyroid carcinoma.⁵³ Nodules which concentrate I^{131} are classified as "hot" or "warm" depending on the degree of uptake. "Cold" nodules are those which do not concentrate significant amounts of I^{131} . Although the great majority of thyroid carcinomas are non functioning and are thus cold nodules, this is also true of many benign adenomas. Also, since a nodule may be surrounded by normal thyroid tissue, it may be non functioning yet give the impression of concentrating I^{131} .

Figure 6 is a scanogram of a diffuse toxic goiter. The two lobes of the gland are well outlined and the absence of nodularity is demonstrated. Figure 7 is a scanogram of a goiter with a single large nodule in the upper pole of the right lobe. This nodule would be classified as cold. It was removed surgically and was a benign adenoma. Although, when available, scanograms are of interest and of some assistance in forming an opinion as to the nature of a nodule, they must not be used as a basis for a decision not to operate when other indications for surgical removal are present.

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Case Presentation

Duplication of the Alimentary Tract

Report of Case of Double Uterus, Vagina, Large Bowel and Anus

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DOUBLE intestine has been reported in various animals such as the bird, cow and ox. In man, one of the earliest reports is that of double hindgut which appeared in the early eighteenth century "Ephemerides" of Leopoldine Academy published in Frankfurt, Germany 1712-1717). Since then various cases of duplication of different parts of the alimentary tract have been reported. Gray (1940)¹ was the first to report a case of duplication of the large intestine.

We recently examined and treated a negro girl six years of age with the symptoms of incontinence of feces since birth, which were found to be due to congenital abnormalities of the hindgut. The case is here reported because of the rarity of the condition and the simplicity of the treatment to remedy the distressing complaint.

Case Report

H. W., a six-year-old negro girl, was admitted to Groote Schuur Hospital* on April 28, 1955, with the complaint of incontinence of feces since birth. According to the hospital notes, she had been admitted previously at the age of eleven days with the symptoms of a partial large bowel obstruction which was thought to be due to a stenotic ectopic vaginal anus. This was dilated with complete relief of the symptoms.

On examination, the child was found to be well-nourished and of normal development for her age. There was some distention of the abdomen with masses of indentable feces palpable in the hypogastrium and both iliac fossae. Examination of the perineum revealed the absence of an anus in the normal position but feces was noticed to come from the vagina.

Under general anesthesia a more careful examination was made of the introitus (Fig. 1). It was found that the vagina was divided by a vertical septum along its

whole length and at the distal end of the posterior vaginal wall were two rectal orifices, right and left, through which fecal material escaped. On digital examination each of these openings led into a separate



Fig. 1. Photograph of the perineum, and introitus showing the ectopic vaginal ani and septum dividing the vagina.

rectum. The urethral orifice was single. Cystogram and pyelograms revealed no abnormality in the kidneys or urinary tract.

Attempts at salpingograms were unsuccessful.

After cleansing the bowel through both external openings to relieve the fecal impaction, a barium enema was done. The barium was introduced by means of a catheter in each rectum. This investigation confirmed the

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diagnosis of duplication of the rectum (Fig. 2) and also revealed duplication of the entire large intestine (Fig. 3).

An emergency laparotomy was performed eight hours

At operation no cause for the acute symptoms could be found; however, examination of the large intestine was accomplished (Figs. 4 and 5). The bowel was found to be normally rotated with fixation of the cecum



Fig. 2. Barium enema showing duplication of rectum.



Fig. 3. Barium and air used to show duplication of cecum, ascending, transverse and descending colon.



Fig. 4. Shows (1) duplicated sigmoid colon lying posteriorly and (2) bladder anteriorly. (3) Note ligatures on bladder where anterior mesentery was divided.



Fig. 5. Longitudinal bands on duplicated transverse colon.



Fig. 6. Posterior surface of bladder showing (1) the double uterus; each uterus has a (2) single tube and (3) ovary.

after the roentgenographic examination because the child developed severe abdominal pain with rigidity of the abdominal muscles. It was feared that the manipulation during the examination may have perforated the bowel.

in the right iliac fossa. There was a common mesentery for the double large intestine and it was clear from the position of the longitudinal bands that there were two segments from the cecum to the rectum. The ter-

minal ileum was single and only one appendix could be detected. The sigmoid was unusually redundant and a persisting remnant of the anterior mesentery was found fixing the lower half of the posterior wall of the bladder to the anterior abdominal wall. On examination of the pelvic contents a double uterus was found. Each uterus had a single tube, ovary and round ligament (Fig. 6). The abdominal wall was closed in layers without further surgical interference and the child made an uneventful recovery.

Two weeks later under general anesthesia the dividing septum in the distal four inches of the large bowel was excised thus creating a single channel and only one external orifice. The fecal stream was diverted from the posterior vaginal wall by cutting back with scissors from the ectopic anus towards and across the normal anal site. No sutures were inserted.²

The postoperative treatment consisted of dilating the new passage daily and preventing fecal impaction with aperients and enemas.

Two months after this operation, the wound in the posterior vaginal wall had healed and a single external orifice in the perineum functioned with full continence.

The child was discharged, after the mother was taught to dilate the newly formed rectal canal.

Discussion

Duplication of the alimentary tract is a term suggested by Gross et al (1952)³ to describe a group of malformations with a common embryologic derivation. Although terms more descriptive of the individual case, such as "enteric cyst," "ileum duplex," "gastric thoracic cyst" and many others have been used, confusion will be prevented by using the term "duplication."

Hollow structures with three main characteristics are included in this term, namely:

1. The wall contains a coat of smooth muscle which may consist of one, two or three layers of muscle fibers. This characteristic immediately differentiates duplications of the alimentary tract from lymphatic and chylous cysts.
2. The lumen is lined by alimentary mucous membrane (not necessarily corresponding to the particular level of the duplication).
3. They are usually attached to the parent viscus although cases have been described where the cystic structure was some distance away and attached by a mesentery.

In approximately 80 per cent of duplications, the lumen does not open into the parent viscus and a cystic structure with the above mentioned characteristic results containing the secretions of the mucous membrane lining the cavity. The character of this secretion may be altered by patho-

logic changes resulting from congestion or ulceration of the mucous membrane or infection of the cyst. Ulceration is especially prone to occur when gastric mucosa forms the lining. The acid secretion and enzymes of the gastric juice are responsible for the destruction of the lining.

In cases where the lumen opens into the parent viscus, the fluid contents intermingle. Peptic ulceration may then result in severe gastrointestinal bleeding. (Barrett, 1951,⁴ and Wooler, 1950⁵). With duplication of colon and rectum or rectum alone, an external opening may also be present and this anomaly will conduct the fecal stream.

About three quarters of duplications are connected with the small intestine, but the anomaly may be found anywhere from pharynx to rectum. In 150 cases collected by Lo Presti and his co-workers (1950),⁶ cited by Maingot, the distribution was as follows: tongue two, esophagus sixteen, stomach eight, small intestine 115; colon five, and rectum four. The sixty-eight cases from the Children's Hospital in Boston³ were distributed as follows: tongue one, thorax sixteen, stomach two, small intestine thirty-two, cecum and colon ten, and rectum three.

Until 1944, the diverticulum theory propounded by Lewis and Thyng (1909)⁷ was largely accepted. These workers frequently observed out-pocketings or diverticula in the fetal alimentary tract of certain animals. As a rule, these out-pouchings regress and disappear; their persistence may give a plausible explanation for duplications. Against this theory is the fact that the evaginations consist only of mucosa and serosa and occur mostly along the antimesenteric border of the gut. Duplications, on the other hand, always occur on the mesenteric border and have a muscle layer.

Separation of a group of cells from the primitive intestinal tube may possibly develop into a structure having all of the characteristics of a duplication; however, a more acceptable theory was published by Bremer (1944).⁸ He points out that at about the six weeks' stage of intrauterine development, the lumen of portions of the intestinal tract become completely occluded by a rapid proliferation of epithelial cells. When the lumen reforms by the formation and coalescence of vacuoles in the solid mass of cells, he suggests that a group of vacuoles may not become continuous with the lumen. This isolated portion of the primitive gut can be expected to form a hollow duplication

which has in its wall all the histologic elements of some part of the alimentary tract. Moreover, it is attached to the otherwise normal alimentary system.

Edwards⁹ believes that duplications result from an attempt at formation of a twin which occurs at a late stage and thus affects only a limited segment of the alimentary tract. In support of this theory is a case reported by Kratzer, Dixon and Bargaen (1927)¹⁰ of duplication of the entire colon and terminal ileum associated with parasitic twin.

In about 30 per cent of cases of duplication, other developmental anomalies are present. In the sixty-eight cases described by Gross, twenty-one had other congenital defects of which atresia of the ileum or esophagus, malrotation of the intestine, and anorectal malformation were most significant.

The case reported herein, although presenting the single symptom of fecal incontinence, had several congenital malformations. As an embryologic explanation of the case in question, it is suggested that the duplication of the entire large bowel resulted from a double recanalization of the bowel after the solid stage (Keith¹¹). The ectopic external openings resulted from incomplete migration of the hindgut dorsal to the cloaca and the failure of establishment of a connection with the perineum (Keith 1952¹²). The two lateral vaginas were the result of a failure of the fusion

of the Mullerian ducts. This failure of fusion was also responsible for the duplex uterus. (Keibel and Moll, 1912¹³ and McBride, 1930¹⁴).

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THYROID FUNCTION TESTS

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Continuation Study

Management of Head Trauma in Children

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Skull Fractures

EVIDENCE of craniocerebral trauma may be present in an infant at the time of birth. When it occurs at such an early age it is generally but often incorrectly attributed to the use of forceps. Depressed skull fractures of enormous size may be observed in newborns who have had no contact with forceps. These depressions usually result from moulding of the very thin calvarium during the passage through the birth canal. They may vary from a small dent, a centimeter or two in diameter, to a depression of the entire side of the calvarium. They may even be bilateral. These depressed fractures usually reduce themselves spontaneously within the first seven to ten days of life, but if they do not, surgical elevation is necessary to prevent damage from compression of the rapidly growing brain.

Skull fractures in infants can be likened to depressions in a ping-pong ball because of the malleability of the skull. They are seldom comminuted and it is unusual for the injury to lacerate the brain. In older children, after the calvarium has become more solidified, compound comminuted fractures are fairly common. When they occur, early elevation of the bone fragments and closure of any associated dural tear is mandatory. The initial surgery should be definitive. If it is not possible for the initial surgery to be definitive because of deeply placed fragments or location of fragments in areas where one might expect severe bleeding from the brain or dural sinuses, it is probably wise to shave the adjacent area, apply a sterile dressing, or pull the skin edges together with a few sutures and transfer the patient to the care of a neurosurgeon. Children with head injuries can generally be readily and safely transported in the back seat of an automobile. They tolerate transportation well even at a very early age.

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Linear fractures are of relatively little significance unless the fracture line crosses the middle meningeal artery or a dural venous sinus. In these latter instances a child must be watched very closely for signs of extradural or subdural bleeding. The management otherwise is that of a closed head injury. Linear fractures often are associated with subgaleal hematomas. Palpation of the edge of the hematoma which is firm, and at the center which is soft due to liquification of the clot, gives the impression a depressed fracture exists. Radiographic examination may be necessary to differentiate them. Because of the thinness of the bone in infants and younger children, an extradural hematoma may automatically decompress itself by leakage of blood through the fracture line, especially if the fracture line is widened because of increased intracranial pressure. This, of course, produces a subgaleal hematoma which is generally of very little clinical significance, except that its development in this manner might have been life-saving. Occasionally a linear fracture is associated with lacerations of the meninges and cerebrospinal fluid may leak out into the subgaleal space. This cannot be differentiated from subgaleal blood except by aspiration or continued observation. If it is blood, discoloration of the overlying skin occurs in a few days so differentiation is apparent. Seldom do either of these conditions need special treatment. If there is evidence of abnormality on neurologic examination, surgical removal of any subdural blood or cerebrospinal fluid and closure of the dural laceration is necessary. Subgaleal fluid accumulations not associated with neurologic abnormalities seldom need be aspirated but, if this is necessary, extreme asepsis is advised because of the natural capabilities of these cavities to promote bacterial growth.

Closed Head Injuries

The best treatment of closed head injuries revolves around good common sense and judgment. There is no special panacea. The general prin-

ciples of maintaining an adequate airway and treating shock are followed. It is emphasized that whereas shock may be present, it is an unusual accompaniment of head injury and, if present, careful search for a cause other than the head injury is advised. Following this, routine skull roentgenograms should be taken. It is believed that any patient with a head injury of sufficient severity to produce unconsciousness always should have skull roentgenograms. Only too often a depressed fracture can be diagnosed only by roentgenography. Also the evidence of a linear fracture crossing the area of the middle meningeal artery or the venous dural sinus is a warning of possible development of an intracranial hematoma. Lumbar puncture is advised against because it is noncontributory to diagnosis or treatment. Repeated notation of vital signs, including state of consciousness is mandatory. Alterations in level of consciousness, vasomotor status, or development of localizing neurologic abnormalities may herald intracranial bleeding. Children with head injuries should be maintained in adequate hydration. It is unwise either to force fluids or to restrict them to a point of dehydration. Sedation is seldom necessary; if used, it should be in small doses and care should be taken not to screen mental dullness due to increased intracranial pressure. Chemotherapy is desirable. Ambulation should be started as soon as any abnormal neurologic signs have cleared and the child is relatively symptom-free.

Subdural Hematomas in Children

The problem of subdural hematomas in children is entirely different from that in adults. In the case of adults, there is usually a definite history of injury, following which the patient has pronounced neurologic signs and symptoms permitting one easily to recognize the diagnosis. The treatment is to make trephine holes in the calvarium and evacuate the hematoma, following which the patient generally gets along very well.

In children, however, there is seldom any history of injury. Approximately 90 per cent of hematomas occur in children less than six months of age. The usual history is that the mother had a difficult labor or that the child had some respiratory embarrassment immediately following delivery. The child then gets along seemingly well for several weeks or months, except that he is a nurs-

ing problem. He fails to take his feedings, he is more irritable than normal, and the mother may notice that the child's head is enlarging rapidly or that the anterior fontanelle is bulging. When the child is seen by the physician, he presents a problem which at first seems to be simply one of nutrition, but then it becomes evident that the circumference of the head is enlarged beyond normal and the anterior fontanelle may be tense. The diagnosis is established by aspirating the subdural space after inserting a needle through the lateral angle of the anterior fontanelle. Normally, only a few drops of cerebrospinal fluid are obtained with such an aspiration, but in case a hematoma is present ten or more cubic centimeters of xanthochromic fluid can be obtained. Simple aspiration of the hematoma will seldom result in a cure in children, because there is a membrane around the hematoma which acts osmotically. The hematoma recurs. In order to cure the hematoma it is necessary to turn down a craniotomy flap and remove the hematoma along with the encircling membrane. Usually these children are not in good enough physical condition when first seen to tolerate a craniotomy. In fact, bilateral craniotomies are generally necessary, because 80 per cent of hematomas in children are bilateral. Therefore, it has been the policy to aspirate the hematoma daily, first on one side and then on the other, thereby reducing increased intracranial pressure. When the pressure is reduced the child usually begins to take fluids, and additional fluids may be given intravenously or subcutaneously. After a period of a week to ten days, the baby's general condition is usually satisfactory for craniotomy. The second craniotomy is done about a week later.

The postoperative convalescence in these children is generally uneventful, and the eventual prognosis is excellent. The children seldom have any physical, neurologic or psychiatric disturbance as a result of the hematoma. The reason that it is so important to remove totally the bilateral hematoma is that a child's brain doubles in size the first three months of life and doubles again in the next six so that at the end of nine months it is approximately four times birth size. If the hematoma and encapsulating membrane are permitted to remain, the brain development is greatly inhibited so that convulsive seizures, cerebral spasticity, and mental deficiency may occur.

Editorials

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STAPHYLOCOCCUS AUREUS— “HOSPITAL STRAIN”

The rapidly accumulating knowledge of the almost universally endemic virulent staphylococci in our hospitals has become one of the most important topics in medicine. Led by Minnesota's Wesley W. Spink (see article in this issue), the research in this field has revealed facts and trends which must be known by all physicians.

Micrococcus pyogenes, variety *aureus*, *escherichia coli* and certain other normal Gram negative bacillary inhabitants of the intestinal tract have been found to undergo a mutation from antibiotic sensitive to resistant organism strains in patients with or without infections caused by these bacteria. Within a year of the introduction of each new antibiotic the bacterial flora of our hospital rooms, corridors and operating rooms, as well as the nasal passages, skin and apparel of physicians, nurses, patients, and other hospital personnel will reveal the shift from staphylococcus aureus specific antibiotic sensitivity to resistance. A given “hospital strain” frequently varies from that of another hospital primarily in the uses or restrictions of certain antibiotics. Although not generally agreed upon by authorities, certain of these “hospital strains” might well follow a widely proven law of increasing virulence with each successive passage through an inflammatory process. At least one can be sure that they are coagulase positive and virulent, are carried in the nasal passages and on the skin by 30 per cent or more of the people working near the patients and contaminate the skin and upper respiratory passages of new patients within a few hours or days of admission to hospitals. They cause minor to fatal and sporadic to epidemic infections in: the newborn (see article by Williams et al in this issue), the otherwise clean traumatic and surgical wounds, the lungs of the debilitated, the intestinal tracts, in burns and the blood streams as well as in any of the entire gamut of sites of infection which the staphylococcus is capable of causing.

Alert physicians may know, with laboratory aid within eighteen to forty-eight hours of the onset of a suspected staphylococcus infection, its nature and the antibiotics to which it remains sensitive.

The immediate and proper use of two or more of these agents with drainage and other supporting care where indicated will produce improvement and cures unless the infection is too far advanced.

Hospital staff committees have been established throughout the country to control this menace in their institutions. Their efforts in lessening the spread from sites of infection to bed clothing, to dust, to nasal passages and skins of new carriers, to new sites of infection by varied steps and routes have met with success. However, the permanency and omnipresence of this potential danger will be with us for a long time in the foreseeable future.

“SKIN THE SEAL”

We don't know how taciturn the average Eskimo is, but we are willing to recommend a lot of our more verbose colleagues a perusal of the *Eskimo Cook Book**. The recipes in it are the epitome of simple directness. For example, the one entitled Seal's Bare Feet, starts with this imperative, “Put the seal's bare feet into a cooking pan.” And carries on in similar vein for about three more unequivocal sentences to where you have a meal of seal's flippers. Another, for the preparation of Seal Head begins abruptly: “Skin the seal. . . .” No review of the literature; no long-winded assignment of tenuous previous credits; no rehash of inadequate explanations; no impacted mass of proper nouns; no geometric abstractions like informed circles, eternal triangles, or official quarters; no technical waffle (here, this bit of technical waffle: technical waffle is a lot of words that sound good, but don't say anything); no list of references—just “Skin the Seal.”

So much for simplicity; now for forthright expression of opinion. When the contributor of a recipe expresses himself about how all this strikes him, again no straddling of the fence; no ambiguity—just a declaration of how he feels about this

**Eskimo Cook Book*, prepared by the students of Shishmaref Day School at Shishmaref, Alaska, and published exclusively by the Alaska Crippled Children's Association, P. O. Box 912, Anchorage, Alaska. 60 cents post-paid.

dish. For example, after the recipe for Soured Seal Liver: "Most of the boys and girls don't like it, except the grown-ups and old people. I don't like it either."

H.G.M.

THE NEED FOR HOSPITALS AND RELATED FACILITIES IN MINNESOTA

Rehabilitation is the ideal aim of all medical care. Restoration to self-care may be the highest point of return for some, but for many, return to employment is attainable and is of the utmost importance. Our hospitals and related facilities have always been dedicated to patient service. However, the value of integrating the services of one institution with those of other institutions, the combination of which would give the patient the total range of services needed, has not always been recognized. We can no longer afford such separation of function. Nowhere is the inadequacy of old concepts more evident than in relation to chronic disease and to the varied ramifications of long-term illness. We have been prone to feel that nothing could be done for people with such problems. Now we must think in terms of the totality of services needed to halt deterioration and to restore and maintain these patients at the highest possible levels of health and social effectiveness.

Early diagnosis is the key to prevention in chronic illness. It provides detection at a time when available therapeutic weapons are most effective and protects the patient from the cost of continuing long-term care. Ambulatory diagnosis and treatment are less expensive and more convenient to the patient. Prepayment and insurance plans should be geared to encourage patients to procure such on an ambulatory basis rather than through hospital admission.

Recently, interest in nursing homes has increased tremendously. However, even today, in spite of the fact that some very good nursing homes are operating, the average person's concept of a nursing home is an end-of-the-road place for the aged and infirm. Studies of nursing homes have shown that the quality of patient care ranges from very good to very poor. Imagination and initiative in the development of nursing home facilities and services provides a real challenge. After the pa-

tient has received the maximum benefits of hospital care but continues to be in need of nursing care, a good nursing home can be an effective and economical answer. Greatly needed is the development of modern nursing homes in close relationship to hospitals. We must seek improved design, higher standards and the full co-operation of philanthropy, government and insurance in easing the financial burden of patients requiring long-term care.

The patient with a chronic disease who needs hospital treatment requires not only the usual range of services available in a general hospital, but additional services as well. Experts in the problem of chronic illness urge that chronic disease hospitals providing intensive rehabilitation services be constructed as units of general hospitals.

The complete, comprehensive rehabilitation center which provides an integrated program of medical, psychological, social and vocational evaluation and services under competent medical supervision, serves the total patient, not merely his physical disability. It is no longer accepted as adequate to teach a person merely how to manipulate an artificial leg. He must also have an understanding of how to deal with the emotional problems that arise from his crippling and he must be provided with a means of making a living.

The development and operation of all of the various types of needed care facilities requires careful long-range planning, considerable imagination, co-operation, integration and resourcefulness as well as the active support of all concerned. Every community needs a carefully developed plan for the care of the chronically ill, long-term patients which establishes an orderly integration between the health and welfare agencies. The following types of needed facilities should be available for local use, although not necessarily on a local basis in the case of every community:

1. Care in the home. Expanded programs in public health and visiting nursing services as well as homemaker's service will frequently enable persons to remain in their own homes. Most persons prefer care in familiar surroundings under the supervision of their personal physician.

2. Substitute homes such as boarding care homes, homes for the aged and foster homes.

3. Nursing home facilities for the patient whose

This is the third in a series of editorials on hospitals and related facilities in Minnesota.

main requirement is nursing care under regular medical supervision.

4. Hospital care for the patient who needs close medical supervision, intensive professional nursing care, or definitive medical, surgical or rehabilitative services.

Because of extreme personnel shortages in many of the fields of rehabilitation, some patients who would benefit from more intensive rehabilitation services could be transferred for short periods of time to certain facilities not as yet readily available throughout the entire state, including:

5. Chronic disease units of the larger general hospitals, and

6. Comprehensive rehabilitation centers.

While we join forces in our local communities to provide care and rehabilitation services, we need to recognize that many areas will need to plan with their neighboring communities for some of the services on a regional basis. The demand for certain types of services will be limited and the shortage of highly trained technical personnel will be with us for many years.

Although larger communities need the services of physicians especially trained in physical medicine and rehabilitation, many of these services can be given to the patient by other specialists in medicine or by the general practitioner. The misconception still prevails among some physicians who believe that they may refer a patient to a physical therapist, an occupational therapist, a brace man, or a vocational counselor without being familiar with the functions and limitations of such trained health workers and their requirement and need for medical guidance.

Society is rapidly becoming aware of the needs of the long-term patient. New developments are occurring rapidly, many of which are not too carefully planned. These growing pains and the associated frustrations can be overcome if we are aware not only of our strength but also of our weakness and of the areas in which improvement is possible and essential to the ultimate success of rehabilitation as it plays its vital role in the care of the long-term patient.

HELEN L. KNUDSEN, M.D.

MINNESOTA HUMAN GENETICS LEAGUE

The program of the Minnesota Human Genetics League is concerned with the qualitative and quantitative aspects of the population. Thoughtful people throughout the world are now accepting the related problems of the genetics and the numbers and distribution of peoples as the most fundamental ones that there are. It was not always so. The fact that many people are now seeing human biology as the crux of social changes comes through education by the press, radio and television. These distribution mechanisms obtain their data from conferences, research papers and interpretative material produced by organizations like the League.

In 1948, the League helped to sponsor a population conference on the University Campus. At that time, it was necessary to show the public that there was a world population problem. The League cosponsored a second population conference in late January, 1957, which had the ambitious goal of trying to define what an optimum population would be. Roughly how much food, clothing and shelter, leisure time and community resources, are needed per person to ensure a healthy progressive society?

A study initiated by the Dight Institute and the League on Huntington's chorea has led to unexpected successes. The project was started in a very modest way but attracted the attention and assistance of Dr. John S. Pearson, head of psychological services of the Department of Public Welfare of the State of Minnesota. When Dr. Pearson went to the Rochester State Hospital as the research psychologist, he interested the Superintendent and others there in the organization of a Genetics Research Program. The work started with the help of the Dight Institute and was expanded with the aid of a generous grant from the Hill Family Foundation. The program was centered around the Huntington's chorea work, now to be done on a statewide basis. A census of all choreic persons and their close relatives has been completed. A popular interpretive pamphlet about the disease written by Dr. Pearson is being used throughout the nation. The League financed the printing of the first 5000 copies of the pamphlet. Efforts to distinguish which half of the progeny of a choreic

Final editorial in a series of six on the work and accomplishments of the Minnesota Human Genetics League.

person will later develop the disease are being continued. Movies of patients before and after treatment with reserpine show a remarkable suppression of symptoms, which lasts for at least a few months. The understanding of the mechanism of the inheritance of the dominant gene for the disease which the relatives and early-stage patients have obtained has resulted in voluntary and unsolicited guarantees from some that they will refrain from reproduction and further spread of the gene responsible for this horrible disease. Even a few results of this sort are of great significance to the families involved, to the state and the country. A similar program is now flourishing in Michigan, and will no doubt be initiated in other states.

The research project which the League initiated and for which it assumes responsibility is a gigantic follow-up of a study made of the mentally deficient patients at the Faribault School and Colony. The patients there between 1911-1918 and their relatives were studied with geneological, psychological, and sociological techniques. The follow-up of the descendants of the patients and relatives using the same and newer methods has provided vast amounts of data. In many cases, the family group of relatives of the patient comprises over 500 individuals. Every one of the 300 family groups selected for study is different in its display of mental retardation. In those families where mental retardation continues down through the generations, there is an opportunity to make a future intensive study, using biochemical and other medical adjuncts, with the expectation that new diagnostic techniques, and perhaps some treatments, may be discovered which will lighten the load of the mentally retarded and their relatives in the future.

The mental retardation project has attracted wide attention. Sheldon and Elizabeth Reed reported on the progress of the work at the First International Congress of Human Genetics, which was held in August, 1956, in Copenhagen.

In addition to its research program, the League has contributed to general education by bringing world authorities to Minnesota where by public addresses, conferences, and radio broadcasts an awareness and some understanding of human genetics and population problems have been engendered. Dean Laurence H. Snyder, President of the American Association for the Advancement of Science, Lady Rama Rau of India, Philip

Levine, M.D., Edmund Farris, M.D., and many others have left their imprint upon you and me, and the people of Minnesota.

Thus as the Minnesota Human Genetics League completes its first decade of life, it can look forward to a highly challenging program befitting its greater maturity. What has been done is a very small beginning. The opportunity ahead is practically limitless in its potentialities for human good.

SHELDON C. REED

ALCOHOLISM IN INDUSTRY

As a layman with a long and intense interest in the problem of alcoholism, I am grateful for this opportunity to reach the physicians of Minnesota through their journal with regard to the problem of alcoholism in industry. It is hoped that in this and the editorials to follow it will be possible to provide a description of some of the problems that alcoholism presents to industry, some suggestions for meeting the problem, and finally, some suggestions on the physician's role in this problem as seen by a layman.

The fact that a series of editorials on alcoholism in industry should appear in this journal is significant in itself. Some of us who have been concerned about this problem for a number of years have often been impatient with physicians, the clergy, the law and industrial leaders for their failure to recognize alcoholism as one of their responsibilities. Objective reflection, however, will cause us to realize that progress in the field of alcoholism, while still too little and too slow, has in fact proceeded at a rapid rate.

The general acceptance of alcoholism as a health problem today is not a recent development or the result of a sudden awakening on the part of physicians and the public. It is rather the result of an evolution in the thought and actions of our society. Alcoholism has long been considered a moral problem, but it was not until it was also recognized as a medical problem that any real progress in the rehabilitation of its victims was possible.

It has been interesting to observe the growth of interest in alcoholism. Prior to 1935, when Alcoholics Anonymous was started, little was done to help the alcoholic person outside of some church groups and occasional well-advertised "cures." Today, thirty-one states and many cities have active

First in a series of articles on Alcoholism in Industry.

programs for the rehabilitation of the alcoholic, and others are considering the development of programs. Interest in alcoholism has snow-balled, and today this former "hidden sickness" is being cognized and discussed everywhere.

One major product of this evolution in thinking has been the interest recently shown by industry. Several years ago a public opinion poll was taken of top management to determine whether or not alcoholism constituted a problem in industry. The answers were uniformly negative. There was no problem. To anyone familiar with industry or with alcoholism, this should not be surprising. Top management is not always aware of employee health or emotional problems. This is particularly true with a condition such as alcoholism which is kept well hidden until the last stages. It was not until it was clearly demonstrated to management that a serious problem existed that was costing their concerns vast sums of money that any positive steps were taken to meet the problem.

It had always seemed a simple solution for management to discharge alcoholic employees. Management began to recognize the futility and waste of this procedure when it was pointed out that the average employee discharged for alcoholism had been with the company for over twenty years, and was often a highly skilled worker. Soon other factors became apparent. The alcoholic employee was losing more than eighteen days a year because of his illness in comparison with seven or eight days for other employees. Higher accident rates, greater waste and spoilage, and lowered production were other factors that became evident. The lowering of the morale of fellow employees is a factor that is impossible to estimate in dollar value but is nonetheless very real.

Although the physician's relationship to the problem of alcoholism in industry is usually an indirect one, it is nevertheless an extremely important one. Two general areas in which the physician can play a very important part are in the areas of treatment and education. It is on these points that I would like to expand in the editorials to follow.

PATRICK BUTLER, *Chairman
Minnesota Advisory Board
on Problems of Alcoholism*

IT PAYS TO BE NICE TO PEOPLE

Think of the successful people you know. Have you ever wondered how they got ahead? Lucky breaks—maybe. Better education—not all of them. Nine times out of ten it's because they found out that the way you treat others can make or break you, that it pays to be nice to people.

George Brown found this out. He works at the information desk in one of our power and light companies. He has more friends and knows more people than anyone else in the company. Everybody likes him. The company has received many letters telling of his courtesy and helpfulness.

One day while waiting in the lobby for a friend, I couldn't help noticing that most of the people who came in singled him out with a cheery hello, a friendly smile, a how-are-you-today or a how-are-you-doing—all for George. He certainly was getting his share of attention. Then, as he noticed a stranger trying to look in all directions at once, he quickly got up and walked over to him. He talked with him a few seconds.

You could see that the stranger was pleased. They walked over to the elevator and George spoke to the operator. The stranger was smiling now as the operator closed the doors.

When George turned around, he came over to where I was standing and said, "Someone to see Mr. Miller, I just wanted to be sure he got to the right place."

I couldn't hold back my curiosity any longer and asked, "George, how did you become so popular?" I had my own ideas, but I wanted to hear what he had to say.

"Well," he said, "a few years ago, I read in a paper about a man who was included in a will just because he smiled and was nice to people. I thought maybe it would happen to me. So I began treating people like human beings. It made me feel so good that I didn't care if I ever got a million dollars. You know, it pays to be nice to people."

Think it over. Don't you prefer to do your shopping and buy your newspaper at certain places, where people treat you in a friendly way? Wouldn't you sooner work with people who are pleasant and good natured? If people are friendly you like them. If you are friendly they like

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you. It's as simple as that. But since it's simple, don't we often take it for granted?

It's easy to overlook the fact that your job is a great deal more than materials, tools, and methods. It's also people. It's the fellow who works with you, the new man, the old-timer, or the fellow in the office across the hall. It's Joe, Jim, Susie, and all the rest with human feelings, dreams, likes, and dislikes.

Now I can almost hear someone say, "How about the grouch, the sourpuss, the gloom spreader and all the other characters that we run into every once in awhile?" That's an easy one.

Take Ed Smith down at the garage I patronize—a whale of a good mechanic, knows his business and gets the work out, but he's one of those fellows who would just as soon bite your head off as look at you. People stay away from him. With his ability he could be head of the Service Department, but people just don't like him. His treatment of others has boomeranged. To make sure that you are not another Ed Smith, don't overlook the power of friendliness.

Not long ago my friend Harvey Wilson's son, Dick, won a fine promotion simple because he made little extras in the treatment of others work for him. One of the boys from another department came in one day to straighten out some of the work he was getting. He was burned up and let go with both barrels.

Dick could have met him head on with more of the same kind of fireworks—but he didn't. He was as steady as an old sea dog in a storm. He had headed off trouble like this before. Dick listened, asked questions and showed that he was really interested. The smoke cleared and they talked the whole thing over.

When this fellow went back to his department, I heard Dick say, "Anytime anything like that comes up, let me know and we'll work it out." It wasn't long before his ability to get along with others was the talk of the grapevine. Other people were pulling for him. He had a following of boosters. His promotion to assistant department head was one of the most popular ever made in the Company.

His way of dealing with people paid off.

It doesn't take much sometimes to turn things in your favor. The greatest runner in the world isn't more than 5 per cent faster than scores of other runners. The best fighter may win by going just

another round and the greatest inventor by just one more try. Sometimes it takes so little change a minus into a plus. I know of no situation where this is more true than in your dealing with people. You'll find that opportunity is always looking for the person who has that little extensibility to get along with others.

It Doesn't Cost Anything

You don't have to be a millionaire to be nice to people. You can be extra nice and not have it affect your pocketbook one bit. It's free. Here are just a few ideas. You can think of many more.

Wear a Pleasant Face. If you want a better job to turn up, keep the corners of your mouth that way. The other fellow may be a bit grouchy from any number of things that bother us in a day's living and not give a friendly smile himself. Head off grouchiness by smiling before the other fellow has a chance to be grouchy. It's the face with the smile that wins.

Let people know you are glad to see them. Show it in the way you look and what you say. Let them see that twinkle of recognition. Take a tip from your dog, the friendliest greeter of all. He will wag his tail and almost wiggle himself apart to show how glad he is to see you.

If you really want to be especially nice to someone, listen to him with all your heart. My dentist office girl is the kind of person who just can't stop talking long enough to listen to anyone. Give her half a chance and she'll tell you all about her operation, pet peeve, or relatives. Did you ever stop to think, how wonderful it is that the good Lord gave each of us two ears and only one mouth?

How we all like attention! Say something about that special job, good idea or thoughtful favor. Say something about your neighbor's garden, fishing trip or hobbies. There are hundreds of things you can notice about people. Speak up. They'll think you're wonderful.

It's unbelievable but one would think that it's actually harder for some people to part with these acts of friendliness than to part with their money. It's the little things, the tremendous trifles, that get the farthest in the enjoyment of our everyday living. So often it's these things that tip the scale to just getting by or to outstanding success. Don't

neck these acts of friendliness at the door when you go to work. Take them along. Make them work for you.

Check Up On Yourself

There's a fellow over in our sales department, whom I'll call Ned Randall. Ned used to be considered a pretty good man, but something has happened to him. It's no fun being around him anymore. Because he has a what's-the-use-attitude, no one dares give him a break. He does just enough work to get by, and he can tell you just what's wrong with everybody else in the place. How many people do you know who are like Ned Randall, sulking, brooding, blaming others, thinking of quitting, working in low gear—getting nowhere? Stay out of this rut! One of the saddest things about a man in this rut is that he had no idea he was getting into it. Slowly but surely he drags himself down. Before he knows it he has become his own worst enemy.

One sure way to stay out of this rut is to take a good honest look at yourself. Check up on your weak points as well as your strong ones. Don't have anything out. See if you can face up to these.

Give the Boss a Break. Now just a minute, don't backfire at me! He's human too. Maybe he has some shortcomings, but don't we all? Remember, he's got to try to keep everyone satisfied—beginners, old-timers, gripers, good workers, poor workers. He has his troubles, too.

Roll Up Your Sleeves. Pitch in and do your job. You don't like to work with someone who isn't doing his share. There is no future in just getting by—you only cheat yourself. You miss out on the pride that comes from doing a good job, the respect we all have for a person who can really do his job well, and most of all, your chance to show what you can do.

Put something of yourself into your job. My neighbor Henry Sims, a foreman in one of the plants in town, says that he can always spot a coming top notcher by the extras he puts into his job. No one can tell you what this extra should be. You are entirely on your own. Maybe it's a better way to do something, extra friendliness, a little better job—it's up to you.

Be On the Beam. It's almost impossible to

enjoy your work if you aren't friendly with others on the job. We all spend a good share of our daily lives at some kind of work. Why not enjoy it? So don't knock the people who work with you—get to know them. The ability to get along with others will pay you the biggest dividends in the world.

It will pay you to watch these things as carefully and regularly as you wash your face and comb your hair. Pay less attention to the shortcomings of others. Look yourself over.

Make sure you are not standing in your own way.

Go Out of Your Way

"I tried to be nice, but do you know what he said to me?—If that happens again, I'm going to give someone just what he is looking for . . ."

We've all been in spots like this, but very often we give up too easily. We take a what's-the-use-attitude, pull down our flag and quit. The whole day has gone wrong. You have been snubbed—brushed off. So what? You're bound to have a few of them because some people have let themselves get so sour on others that they feel that anyone treating them like a human being is not to be trusted, or is trying to sell them something.

Bill Knowlton, the captain of our bowling team, likes to make this point. "I remember the good cookies my mother used to make. As a youngster I did just what came naturally. The ohs, the ahs, the mms and the great big smile worked wonders for me—two cookies, maybe even three or four. It pays to be nice to people. Time hasn't changed it one bit. It still does the trick."

Go out of your way, carry friendliness to others without waiting for them to come halfway. Stick your neck out. The other fellow may be shy too.

You don't have to be a gushing back-slapper either. People soon spot a counterfeiter in friendliness. And don't just reserve it for Christmas and birthdays—turning it off and on depending on the situation. Make a habit of it.

There is an old saying that goes, "The hardest part of making good is that you have to do it every day." Try out these friendly tips on everyone you meet, the boss, your fellow workers, your family, friends and neighbors. It doesn't cost anything, and it will do you more good than you ever expected.

Working together is not hard to understand

when two men are sawing a log—when nine are playing the favorite American game—when ten are taking orders from the quarterback. But in many other situations we lose sight of the fact that the success and pleasure in work comes from getting along with others on the job.

Give yourself a break. Don't short change yourself. You can have a lifetime of extra success and happiness—beginning right now.

VERNON C. JOHNSON

STUDENT FACULTY RELATIONS AT THE UNIVERSITY MEDICAL SCHOOL

Student faculty relationship are probably the main area of interest of the Medical Student Committee. To discuss the work of this group and leave this area out of the discussion would be a grave error. Student faculty relationships at Minnesota are not really terribly bad, but the point is that they could be, and we feel should be, better.

A poll of students and faculty taken in May, 1953, showed that more than 80 per cent of both faculty and students polled want more opportunity for informal contact between student and teacher. Thus, this is a problem to the faculty as well. However, it has not been an easy problem to tackle.

The genesis of the lack of good relations is obscure. Certainly some of it lies in the very bigness of the institution. It is indeed advantageous to be so close to the main campus of the University, but the University itself is concerned with the lack of school unity that is manifest on the entire campus. Medical students are looking forward to the day when they will have a separate graduation ceremony. We have been led to believe that such a day is coming. Perhaps this one step will add a necessary ingredient to a feeling of unity within the medical school.

The Medical Student Committee has considered a number of ways to improve student faculty relationships. An advisor system was considered but abandoned. Coffee hours for students and faculty members have been tried and seem to be quite successful. Some members of the committee met with the faculty on a student faculty relationships committee. This committee has drawn up its

recommendations, but they have not as yet been presented to the students.

Definite progress has been made to improve relations between faculty members and students. There is a need for continued improvement. The Medical Student Committee is actively working along these lines. Such a program should also add immeasurably to the as yet poorly developed school spirit at Minnesota.

RALPH B. SWANSON

REHABILITATION IN PULMONARY TUBERCULOSIS

Some Illustrative Results of Vocational Training

In the fall of 1954, Papworth made a preliminary survey of the results of the present training scheme introduced in 1948 as a result of agreement reached with the Ministry of Labour. There had been 665 admissions. They were in every stage of disease, the majority in Stage II (moderately advanced). Fourteen persons had died, six of them in the Papworth hospital; all fourteen had advanced (Stage III) disease, with positive sputum. In addition, fifty-two had been discharged as unfit for training. There were 273 still at the Settlement, sixty of them as colonists working in the industries, six as housewives in the village and the remainder at varying stages from rest in hospitals or hostels up to work from three to six hours per day. A total of 306 had left for open industry, and it is the known fate of these ex-patient workers that we shall now consider.

Of the total number, 186 had been admitted because of continuance or recurrence of positive sputum, in spite of hospital, clinic or domiciliary treatment. They had been unable to obtain or unable to retain employment. Once rendered sputum-negative during their stay with us, 102 patients had remained negative up to the date of discharge, while a further forty had again reverted to positive sputum at some stage of residence but had left sputum-negative. This means that 142 (76 per cent left negative to sputum-culture examination over a period of at least three months prior to discharge.

Of 168 men who terminated training between 1948 and 1951, 126 (75 per cent) have remained sputum-negative for three to six years after discharge. This does not include twenty whom we have failed to trace. Only 11 per cent had no active therapy; a similar percentage had chemo-

Final editorial in a series of six on the organization and functions of the Medical Student Committee at the University of Minnesota.

therapy alone. All the others had the addition of some form of collapse therapy.

The work-situation of a similar group of 168 men was most encouraging. Of these 116 (69 per cent) had remained at full work for three to six years following discharge, and 104 (64 per cent) had required no further treatment; six were on part-time work; twenty-seven were not at work, and thirteen we failed to trace.

From this preliminary survey, it is evident that training plus continued treatment can produce results in human happiness and tuberculosis control that repay fully all our efforts, as long as the patient-workers are not worried over their own economic position and that of their families.

The regaining of confidence in ability to work has a marked effect on response to treatment; indeed this confidence is often a factor of greater importance than the administration of drugs and antibiotics.

No further comment is necessary on the value of rehabilitation and vocational training. Here is proof of the conclusions of Sidney H. Dressler and his co-authors in their paper on the needs of the tuberculous in the present trend of treatment.

RICHARD R. TRAIL, M.D.
London, England

MENTAL HEALTH WEEK

Mental Health Week will be observed this year throughout Minnesota and the nation from April 28 through May 4, by proclamation of President Eisenhower.

During this period, mental health will be given the national spotlight, and attention will be focused on the problems, plans and goals of those who work for this important cause.

Mental illness has been termed the No. 1 health problem in this country. Unlike measles and other obvious diseases, mental illness is not easily detected, and millions of Americans can be affected by its devious tentacles, both personally and through closest friends. Even worse, when the symptoms *are* manifested only the smallest percentage of the population know what steps to take to bring about its correction and cure.

Of great importance to business and industry are the three A's of mental illness—accidents, alcoholism and absenteeism. Last year, representatives from Minnesota's industrial and business firms attended a conference in Minneapolis at

which these topics were discussed. This year, a two-day session (April 26 and 27) will be held by members of Minnesota's organized labor and will be known as the Labor Workshop.

Among other aspects of mental health to be publicized during its special week, attention will be called to the "ideal climate" necessary for the containment of mental illness, according to state Mental Health Week chairman Mrs. John B. Ross of Minneapolis.

Such a climate can be created, Mrs. Ross said, by organizing community participation in the Minnesota Association for Mental Health program, by encouraging constructive legislation and by volunteering interest, time and money, during the special week and throughout the year.

For all its terrifying aspects, mental illness can be cured in many cases, said Mrs. Ross. The last few years have shown a tremendous increase in the percentage of cured patients who have been returned to their homes and society.

Quality of treatment plays a large part in these statistics, which range from 45 per cent return at "average" clinics to 70 per cent at those well-equipped and staffed. Building the "average" clinics to "excellent" clinics is a major part of any mental health program.

More than 16,000,000 Americans (1 in 10) are suffering from a mental or emotional disorder. This topic, once taboo, can touch close to home and will receive national attention during Mental Health Week.

Additional information on mental illness is available from the Minnesota Association for Mental Health, 309 E. Franklin Ave., Minneapolis.

EARLY GLAUCOMA DETECTED

A major starting point in glaucoma detection is the use of routine tonometry, results of an 18 months' study by Drs. H. Rommel Hildreth and Bernard Becker of Saint Louis, Mo., have demonstrated.

Routine tonometry (a test to measure tension, as of the eyeball) was performed on all refraction patients over the age of 40 years. Forty-nine out of a total of approximately 2,000 such patients were found to have borderline tensions in the absence of other symptoms or signs of glaucoma or other ocular disease. On the basis of tonography and provocative tests, 69 (72 per cent) of the 97 eyes were classified as glaucoma suspects; and of the 69 eyes so diagnosed, 27 (39 per cent) developed early field loss during a six- to 18-month follow-up period.—HILDRETH, H. R., and BECKER, B.: Routine tonometry, *American Journal of Ophthalmology*, 43:21 (Jan.) 1957.

President's Letter

OUR ANNUAL MEETING

Once again the time is approaching for the physicians of Minnesota, and as many as possible from the neighboring states, to gather in Saint Paul for the annual Scientific Assembly of the Minnesota State Medical Association. When you have had an opportunity to see the program, I am sure that none of you will stay away from Saint Paul willingly on May 13, 14 and 15. The Committee for this Scientific Assembly has arranged an outstanding program. It is a program that any national organization would be proud to present to the physicians of this country and to their communities. Physicians who have national and international reputations have been invited to take part in this program, and all those invited have accepted with alacrity. This in itself indicates the respect with which physicians everywhere view the Minnesota State Medical Association. Symposia, panel discussions, lectures and demonstrations, scientific and commercial exhibits, and a banquet speaker of world-wide renown will occupy three busy days.

On Monday morning, May 13, there will be a panel discussion on "Heart Disease and Pregnancy." Dr. Charles P. Bailey of Philadelphia will discuss "Surgery of the Heart in the Pregnant Patient." Dr. James Metcalfe of Harvard University will discuss "Medical Aspects" of this problem. Dr. Nicholas Aasli of the University of California Medical Center at Los Angeles will speak on "Control of Hypertension in Pregnancy." Dr. I. H. Kaiser of the University of Minnesota will speak on "Obstetrical Problems." The Russell D. Carman Memorial Lecture in radiology will be delivered by Dr. Hans Heinrich Berg of Hamburg, Germany, later that morning.

On Monday afternoon, there will be a symposium on "The Acute Abdomen" with the renowned Dr. H. L. Bockus of Philadelphia as moderator. Dr. N. Logan Leven of Saint Paul; Dr. Leo G. Rigler, Minneapolis; Dr. Harry B. Neel, Albert Lea, and Dr. James C. Cain, Rochester, will participate in this panel.

Any of you who have observed Dr. H. L. Bockus conduct a panel will be expressing regrets for a long time if you do not attend this particular part of the program.

This panel will be followed by a lecture on "Iatrogenic Disorders in Gastroenterology" by Dr. Bockus.

On Tuesday morning there will be a symposium on "Functional Disorders" during which the gastrointestinal aspects will be discussed by Dr. R. S. Ylvisaker, Minneapolis; gynecologic aspects by Dr. Edward A. Banner, Rochester; dermatologic aspects by Dr. Frederick T. Becker, Duluth, and tension states by Dr. Harvey O. Beek, Saint Paul.

After this, your President will discuss some of the problems of the Association and I do hope that you will all be present to help me in solving them.

At 11:00 o'clock Tuesday morning, Dr. Arthur T. Hertig of Boston will present the Arthur H. Sanford Lecture in Pathology, sponsored by the Minnesota Society of Clinical Pathologists.

On Tuesday afternoon a symposium on "The Palliative Treatment of Cancer" will be moderated by the world-renowned Dr. Cornelius P. Rhoads of the Sloan-Kettering Institute for Cancer Research, New York City. Dr. B. J. Kennedy of the University of Minnesota will speak on the use of hormones; Dr. Robert L. Merrick of Saint Paul, on neurosurgery; Dr. Donald S. Childs, Jr., Rochester, on radiation therapy, and Dr. John S. Lundy, Rochester, on the use of drugs in the palliation of the pain of malignant disease.

After this, Dr. Rhoads will deliver a lecture on "The Chemotherapy of Cancer" and physicians of Minnesota will miss a rare treat if they do not attend this lecture.

The speaker at the banquet on Tuesday evening will be Rear Admiral Hyman G. Rickover who is so well-known for his development and construction of the atomic-powered *Nautilus* and who has done outstanding studies of the nation's natural resources. His topic will be "Energy Resources and Our Future."

Dr. Vincent C. Kelley, associate professor of pediatrics at the University of Utah, will give a lecture on "Endocrinopathies in Children" Wednesday morning at 9:00 o'clock. This will be sponsored by the Northwestern Pediatric Society and the Upjohn Company. Following Dr. Kelley's talk, Dr. Cecil Watson of the University of Minnesota will deliver a lecture on "The Practical Appraisal of Liver Function." The latter is the Minnesota Medical Foundation Lecture. It will be followed by a lecture on "The Menopause and Thereafter" by Dr. William H. Masters, associate professor of obstetrics and gynecology at Washington University School of Medicine, St. Louis. Dr. Master's talk is sponsored by the Minnesota Department of Health.

Also for Wednesday morning, the Minnesota Academy of Ophthalmology and Otolaryngology has been most fortunate in obtaining Dr. C. Stewart Nash of Rochester, New York, to present the annual lecture of this organization on "Functional Diseases of the Nose."

On Wednesday afternoon there will be a panel discussion on "Management of Acute Injuries." Dr. Ralph Smith, Minneapolis, will speak on shock; Dr. Harold F. Buchstein, Minneapolis, on head injuries; Dr. Lyle Tongen, Saint Paul, on injuries to the chest, and Dr. E. W. Johnson, Jr., Rochester, on vascular injuries. Truly, no practitioner of medicine could afford not to attend this symposium because of its great value in the everyday practice of the physicians in Minnesota.

I am sure any medical organization would be hard put to find a more practical program of postgraduate education than that which has been planned for you on May 13, 14 and 15.

In addition to this more or less formal program, there will be 23 round-table luncheon discussions on subjects of current interest presented during the noon hour each day by physicians who are authorities in their fields. The space in which these round-table discussions are held is limited. The titles of the subjects to be discussed will be sent to you in the near future, and I would urge you to make your selection as early as possible.

Then, of course, there will be many activities of entertainment including a golf tournament, a skeet shoot, the annual banquet, and the social contacts which all of us make with our colleagues. The Local Arrangements Committee, with Dr. Wallace P. Ritchie, Saint Paul, in charge, has done a fine job of planning these various events.

Finally, of course, there is the Woman's Auxiliary, with Mrs. W. P. Gardner and Mrs. W. P. Ritchie, Saint Paul, in charge of general arrangements. They have planned many interesting activities so that by all means, the ladies should likewise plan to attend the great sessions coming in May.



President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

FEDERAL HEALTH LEGISLATION OUTLINED

Civil Aviation Medicine

Public hearings are scheduled to start soon on the Magnuson bill which would elevate medical discipline in civil aviation to a level commensurate with its importance. The aviation subcommittee of the Senate Commerce Committee will conduct the hearings.

Hill-Burton Act

Senator Hubert H. Humphrey (D., Minn.) has filed S.1487 extending Hill-Burton Hospital Construction Act for three more years, until June, 1962. In his explanatory statement, in which he gave population growth as one of the factors of justification, Senator Humphrey also urged Congress to appropriate the maximum authorized amount of \$210 million as the Federal contribution toward hospital expansion this year.

Armed Services Requirements for Medical Personnel Repealed

H.R. 2822 was favorably reported recently by the House Armed Services Committee. This Administration-supported bill repeals the requirement in existing law for professional examinations of medical, dental and veterinary officers of the Army and Air Force as a step toward promotion. Actually the requirement was suspended in World War II and suspended anew in 1951, but the Defense Department wants it stricken from law. The Navy is not involved since its medical and dental personnel are not compelled by statute to undergo professional examination for promotion.

VETERANS AFFAIRS COMMITTEE REVIEWS MEDICAL CARE

Hospitalization and medical care of the nation's veterans was the subject of spirited hearings recently. As in the past, attention was primarily centered on the patient's ability to pay for care of nonservice-connected conditions. Witnesses appearing before the House Veterans' Affairs Com-

mittee represented the AMA, the VFW, AmVets, the DAV, the National Medical Veterans Society and the American Legion.

The AMA argued that good medical care should be available to all who need it, and that to give preference to veterans with nonservice-connected disabilities is an entering wedge to socialized medicine. The AMA supports the Teague Bill to institute tighter economic screening of applicants.

The VFW disputed the figures used by the AMA on the number of patients in VA hospitals for nonservice-connected disabilities. They urged that workmen's compensation fees be turned over to the consultants who care for such cases in VA hospitals. The AmVets reaffirmed their support of the existing policy on care of n-s-c disabilities and pledged aid toward elimination of abuse.

The DAV criticized "the backward steps advocated by the AMA and some others." The same group reminded the committee of their convention endorsement of chiropractic care of veterans on an out-patient basis. The American Legion expressed opposition to any curtailment of benefits and cited survey findings indicating that the majority of n-s-c admission on medical and surgical wards cannot afford to pay.

Dr. Milton V. Davis, Dallas, president-elect of the National Medical Veterans Society, testified in favor of an austere program. NMVS opposes the construction of any more veterans hospitals, and the admission of veterans who have workmen's compensation coverage.

HOSPITAL MEDICAL CARE PAYMENTS TOTAL OVER \$2 BILLION

Hospital and medical care payments to help cover the costs of treatment and physicians' services amounted to \$2.1 billion in 1956, the Health Insurance Institute reports. The figure includes replacement of income lost through sickness or disability. A survey conducted among the country's insurance companies revealed that reimbursements through group insurance plans in force during the year totaled \$1.5 billion or 20.9 per cent over 1955, while payments through individual policies totaled \$601 million, a gain of 12.8 per

cent, for an over-all increase of 18.5 per cent in benefit payments over 1955.

In compiling its report of payment for health care by the insurance companies throughout the United States, the Institute stated that the increase in such payments reflects the continued efforts of the public to pay its doctor and hospital bills through the voluntary non-governmental mechanism.

GOVERNMENT TO SPEND \$14 BILLION FOR WELFARE IN NEXT BUDGET YEAR

In the new budget year, the government will spend \$14 billion in what the Budget Bureau labels "labor and welfare" activities. This does not count spending on some other individual-aid programs—\$5.5 billion for aid to veterans and \$5 billion for aid to farmers, for example. The \$14 billion compares with the \$3.2 billion that the government was spending on the same programs ten years earlier, in 1948. For example, people on old-age insurance benefits (including retired workers and dependents and widows and children of workers) totaled 2.4 million in 1948; the total now is 9.6 million. The number of individuals on public-assistance rolls in 1948 (including needy aged persons, dependent children, the blind, disabled and others) was 4.1 million; today the total is 5.4 million. The total on old-age insurance and public assistance in 1948 was 6.5 million; today the total is 15 million.

Additional welfare programs put additional millions of individuals on the receiving end of the government's activities. School children offer an example. In the new budget year, federal taxes will help pay for 1.7 billion hot lunches for more than 9 million youngsters. There will also be new public housing projects which will provide homes for 35,000 families.

PHYSICIANS THREATEN STRIKE IN BRITAIN

Early in March the British Medical Association endorsed a strike by all of Britain's family doctors against the national health service to press their demands for a 24 per cent wage increase. The group's general council said general practitioners "will be advised to send in their resignations from the service" unless the government meets their pay demands or submits them to arbitration. The doctors were reported to feel they could then further embarrass the govern-

ment by charging fees to any patients requiring medical care and by refusing to issue sickness certificates. Quite a good deal of public sympathy for the doctors' case has been aroused by wide publicity from the press and television.

COSTA RICAN DOCTORS ATTEMPT TO FINANCE RETIREMENT FUND

The medical profession in Costa Rica is trying to finance a retirement fund for its members by a plan to charge drug salesmen 75 cents every time they make a business call on a physician. The 15 major U.S. drug manufacturers who do an estimated \$4 million annual business in Costa Rica have denounced the plan as "an unethical extortion." Most of them say they will close their offices if the retirement fund is not abolished.

Established by the National Medical Union, the plan calls for the salesman or his company to purchase a book of 75-cent coupons. When making his "good will" call to explain new medicine or products to a doctor, the representative must turn over one of the coupons to the doctor or he will not be seen. On the basis of the 120 representatives and salesmen operating in Costa Rica who average a minimum of six calls a day, the medical profession had expected to collect a good \$500 a day for their retirement fund.

Late last month an alternative plan was offered by the medical union. This would finance the fund through a special tax on gross sales of imported drugs. Other Latin American Medical Associations are following developments in Costa Rica very closely.

RUSSIAN TECHNOLOGY IS RAPIDLY APPROACHING U. S. STANDARDS

Recent statistics reveal that Russian technology, only some twenty-five years old, is rapidly approaching U.S. standards. In Russia last year the million who graduated from high schools had successfully passed five years of physics, five years of biology, four years of chemistry, ten years of mathematics through trigonometry, one year of astronomy and six years of foreign languages. In the U. S. in 1950, for example, only four per cent of our high schools were teaching physics; 7 per cent, chemistry; 13 per cent, geometry, and 27 per cent, algebra.

In addition, Russia has thirty-three universities, 180 technical institutes and 3,796 trade schools. The trade schools turn out 70,000 technicians

for assignment to routine scientific tasks. The 266,000 now attending engineering schools are selected, gifted students and are pushed to the limit of their intellectual abilities. Their tuition is free, and they receive pay. Thirty per cent of all students are enrolled in engineering.

In the U.S. there are 218 accredited engineering schools with 156,000 students enrolled. This is only 8 per cent of all college students.

MEDICAL STUDENT STATISTICS COMPILED

A recent AMA report says that medical students who were born and raised in small communities usually go back to small towns to practice after their graduation. Also, the report says, graduates whose prior residence was in the smaller communities are less liable to limit their practice to a specialty. The publicly-supported schools—state or municipal—draw a higher proportion of their students from smaller communities and consequently contribute comparatively more physicians to the smaller communities than do the private schools.

The University of Tennessee Medical School at Memphis turned out more doctors in 1956 than any of the other seventy-six four-year approved medical schools in the United States. The Tennessee school, which operates on a year-round basis and admits several classes annually, graduated 199 young M.D.'s during 1956. It was one of six schools graduating more than 150. The other five and the number of 1956 graduates were: Michigan at Ann Arbor, 189; Jefferson, at Philadelphia, 171; Illinois at Chicago, 159; Texas Medical Branch at Galveston, 151, and Harvard at Boston, 151.

EARNINGS OF PHYSICIANS SURVEYED

Salaried vs. Self-Employed

The typical salaried physician, according to a recent survey, earns only seven-tenths as much as the typical self-employed physician but in the past four years the former has improved his lot somewhat more than has the self-employed man. He also has more free time as he puts in ten hours less per week than the doctor who works for himself; yet both men handle about the same number of patients per working day. Average net earnings of salaried physicians in general practice

is \$10,400 versus \$14,817 for the self-employed; salaried physicians in specialty practice earn about \$12,490 while their self-employed colleagues earn about \$18,000. In industrial practice, however, there is almost no difference between the incomes of salaried and self-employed physicians and in the case of internal medicine, there's a difference of \$600, in favor of the salaried man.

Partnership vs. Group Practice

In contrast to the typical solo physician, the typical doctor in a two-man partnership nets about 33 per cent more from practice. The typical member of a larger partnership or group nets about 43 per cent more than the solo man.

A survey shows that net earnings per doctor of men in a two-man partnership is \$19,966; net per doctor in a larger partnership or group is \$21,460 and for the solo practitioner the total is \$15,028. Men in all three groups seemed to devote about the same amount of time to medicine yet the typical M.D. in combined practice sees five or six more patients per day than does the typical solo doctor.

Male vs. Female Income

Most women physicians earn considerably less than their male colleagues. However, she usually works shorter hours—about 25 per cent shorter—than does the male M.D. Accordingly, she sees only 75 per cent as many patients. Her lighter patient load also leads to a higher ratio of expenses to gross receipts. Even on an hour-for-hour basis, the typical female doctor nets only two-thirds as much from practice as the typical male doctor. The average woman in general practice nets \$8,000 annually versus the male M.D.'s \$14,959; the woman in specialty practice nets \$10,050 in contrast to the male specialist's \$18,027.

MINNESOTA PHYSICIANS CONTRIBUTE \$28,000 TO AMEF

A total of \$28,000 was donated by Minnesota physicians to the American Medical Education Foundation in 1956 for the support of the nation's 83 medical schools; \$19,000 of this total was earmarked by donors to the University of Minnesota Medical School. Dr. Charles Rea, St. Paul surgeon, was Minnesota chairman for the 1956 AMEF campaign.

History of Medicine in Minnesota

THE HISTORY OF MEDICINE IN POLK COUNTY

J. F. NORMAN, M.D.

Crookston, Minnesota

(Continued from January issue)

The First Hospital

The pioneer physicians of Polk County did most of their work in their offices or in homes. This work included whatever surgery was attempted, and, of course, all obstetric cases. The local citizens felt that facilities were lacking for medical care and thus the advantages of a hospital were emphasized and talked about among themselves. Whether any of the doctors in the county took part in this movement toward acquiring a hospital is not known. At a meeting of the County Commissioners on July 25, 1891, it was voted to establish a hospital to be known as the Polk County Hospital in Crookston. While it was to be a county hospital mainly for indigents, provision was made for the admission of paying patients. There is no evidence available that this hospital had facilities for surgery; most of its work consisted in bedside nursing of medical cases.

The Commissioners' records of Polk County (Book B, Page 129)** show the following report: "The Committee appointed on Hospital, having in a report expressed themselves favorable on the erection of a suitable building in the City of Crookston for that purpose. The Board as a whole conjoined in, and adopted the following resolution relative thereto, to wit: Resolved that the amount of three thousand dollars be, and the same is hereby appropriated out of the General Revenue fund of the county for the purpose of purchasing and/or erecting in the City of Crookston, a County Hospital. On motion the County Auditor was instructed to advertise for bids from a physician to attend to the Polk County Hospital, all bids to be filed in the County Auditor's office on or before Jan. 6, 1892. The only bid, that of C. E. Dampier at eleven hundred and fifty-two (\$1,152) dollars per year, including medicine, was rejected. Moved and seconded that when the services of a physician or surgeon are required at the County Hospital, in the City of Crookston, Mathew Watts of said city be called upon to render such services." This was unanimously approved.

M. E. Kirsch, chairman of the Committee on County Hospital submitted the following report which was on motion accepted and ordered published:

"Gentlemen: I hereby submit to you report of the County Hospital for the year ending Dec. 31, 1894:

"Admissions, 42 patients with 12 deaths. Of these deaths there were 4 due to consumption and 2 due to Typhoid; 3 due to heart diseases; 1 liver complaint; 1 Pneumonia and 1 tumor. Number of charity patients admitted during this year: male 34, female 8, total 42. Number of private patients admitted during the year; male 6; female 5, total 11. Total 53. Number of deaths during the year: male 11, female 1. Total 12. Number of visitors during the year 1,663." There were 6 deaths for the year 1895: consumption 1, dropsy 2; typhoid 2 and blood poisoning 1. One of the typhoid deaths was that of Dr. Mathew Watts, a practicing physician of Crookston."

**From the Commissioners' Records of Polk County: Meeting July 25, 1891, Book B, p. 129.

At the December, 1895 meeting, the rules of the County Hospital were amended as follows:

"Moved by Commissioner Norland that the rules governing the county hospital be so amended as to authorize the issuance of tickets of admission to said hospital, the uniform price of such ticket to be \$10.00 each, and that 500 of such tickets be at once printed and placed on sale, the style and conditions of such tickets to be prescribed by the hospital committee."

This is an interesting instance of very early hospital insurance.

Later: "The lease of the County Hospital made by the hospital committee with Dr. W. O. Tessier, together with the bond executed by said Dr. Tessier in connection with said lease were on motion approved."

On request of Dr. Tessier, on September 16, 1897, the above lease was cancelled, and the bondsmen of Dr. Tessier relieved of further liability. On July 26, 1898, the County Auditor was instructed to balance and discontinue the Hospital Fund by charging to the County Revenue Fund the amount overdrawn on the Hospital Fund. Later, the County Auditor was instructed to advertise for bids for the sale of the Polk County Hospital, building and grounds. A bid of Z. Giroux for \$1,500, was accepted September 5, 1902.

Thus ended the life of the first hospital in Polk County, after having had a rough time during its few years of existence.

Following are biographical sketches of the physicians who contributed to Polk County medical history.

Biographical Sketches

Edwin Clark Anderson graduated from the University of Minnesota in 1897 and came to Fertile shortly thereafter. He was a surgeon there for the Northern Pacific Railway Company. He was a member of the Fertile Board of Health and was medical examiner of the Mutual Life of New York, Northwestern Insurance Company of Milwaukee, Mutual Benefit of Newark, New Jersey, Equitable Life of New York; Provident Life and Trust Company of Philadelphia, and the Bankers Life of St. Paul. He was a member of the A.O.U.W. Lodge. Dr. Anderson is listed in Fertile in 1898 with Dr. Arne Nelson and Nels Nelson; in 1900 with Drs. Arne Nelson and John N. Risjford.

William J. Bahnsen, a practicing physician and surgeon who died at the age of thirty-two years at the hands of a murderer, came to Fisher in May, 1887. Born in Germany, he came to the United States as a child. He graduated from the College of Physicians and Surgeons, Chicago, Illinois, in 1885 and was licensed in Minnesota on July 22 of the same year (Certificate No. 1083). He died in August, 1890, after being shot in the back of the head as he was boarding a train after a country call near Fisher. At this time he was located in Crookston. The *Fisher Bulletin* of March 14, 1891 gives the following biographical account:

"Dr. Bahnsen, the victim of Horace Russell, was the third of a family of nine children, six of whom survive him. He was born in Hamburg, Germany, July 31, 1858. When he reached his seventh year, he came to the United States and settled at Rock Island, Illinois. He received a fair education and, having a taste for mercantile life, entered a hardware store, but after two years' trial of that business, abandoned it and secured a clerkship in a jewelry store. He remained in that capacity several years and then entered a medical college in Minneapolis and remained there one term. From there, he went to Chicago and entered the College of Physicians and Surgeons and after receiving his second course of lectures went to New York and completed a course at the Bellevue Hospital. By this time, he had secured a

good knowledge of medicine and concluded to return to Chicago and complete his studies at the P. & S. College. This he accomplished with credit to himself and was awarded a diploma with the congratulations of the professors of the college. He then went to Meeker County, Minnesota, and practiced medicine for one year, but, not being satisfied with his knowledge of medicine and surgery, he went to Europe and studied several years in a hospital at Hamburg and colleges at Berlin and Heidelberg. From both of these famous schools he was awarded diplomas of the highest order of merit. Armed with these formidable certificates and the one awarded him at Chicago, he returned to the United States and on May 16, 1887, arrived in Fisher.

"At this time, his youthful face operated unfavorably against his securing a lucrative practice, and it was only after he had treated complicated diseases that the public became aware of his superior abilities. After he had been a resident of Fisher six months, his fame spread in all directions and was in constant demand as a consulting physician by the profession in Crookston and Grand Forks. His knowledge of surgery was wonderful and many of his successes, had they been performed in St. Paul, Chicago, or any other large city, would have elicited lengthy and favorable plaudits from the press."

The doctor apparently had a smile and good-will for all, never permitting himself to become annoyed by remarks of unfriendly persons. He was a natural-born physician and had he been permitted to enjoy longer life, the people of the vicinity would have had cause to bless his talents and memory, according to *The Bulletin*. He left a widow, the former Annie Elbie, of Fisher, who moved to Decorah, Iowa, after his death.

No death record of Dr. Bahnsen could be found in Polk County or in the State Department of Public Health of North Dakota. (Records in the latter office were checked because of the possibility that he was taken to Grand Forks and that he may have died there. The lack of such a record does not rule out this possibility, as the records of deaths in North Dakota are incomplete prior to 1908). Some pioneers recall that his body was shipped to Rock Island, Illinois, and also that the murderer was freed for some reason. It has not been possible to ascertain the reason for the assassination.

Frank Blakesley was graduated from the Medical department of Hamline University in 1897. He practiced at Fosston and was licensed in Minnesota, June 10, 1897 (Certificate No. 767). We have been unable to find any further history on Dr. Blakesley (also spelled Blakeslee) except that he is listed as practicing in Shevlin (Clearwater County) in 1903 and 1905 and in Bemidji in 1909.

Hamilton Philo Boardman* was in Fishers Landing on Red Lake River for five years in the 1880's. He was born in the late 1850's, the fourth child of Philo Boardman and Jane Hackett Boardman, early settlers in Cascade Township, Olmsted County. Philo Boardman and his wife came to Minnesota in 1855 by ox team and wagon, reaching here after a trip of two months. Philo had been a farmer and stock raiser. After his wife died, he remarried and in 1879 went to Texas where he went into the cattle business. He must have had a good idea of Hamilton's qualities for studying because he willed his land to his older sons with the understanding that they would see to Hamilton's education. The two brothers were Elkanah W. Boardman and Markus J. Boardman, the sister, Margaret (Mrs. William Heaney). Dr. Boardman had his preliminary education in the district village schools. His first medical instruction was received from Dr. W. W. Mayo with whom he studied in the late 70's. His formal medical education was obtained at Bellevue Hospital Medical College, New York, from which he graduated on

*Much of this biography is taken from Dr. Boardman's biography in the "Medical History of Olmsted County," by Norah M. Guthry, MINNESOTA MEDICINE, pp. 375-377 (April) 1950.

March 14, 1880. Three months later—in June—he moved to Oronoco, Olmsted County) where an opening was provided through the drowning of Dr. John N. Farrand. In 1881, however, he moved on to Fishers Landing in Polk County. He stayed there five years. He received his Minnesota license under the "Diploma Law," November 24, 1883 (Certificate No. 401), three days after he had registered in Dakota Territory. Late in 1886, he moved to Oakes, Dickey County, in the Southern part of North Dakota. He practiced in Oakes for fourteen years and established his own hospital in 1901; the hospital seems to have been successful because it needed enlargement in 1902 and again in 1905. In 1907 he retired and moved to California—first to Ocean Park and later to Santa Monica where he died in 1925. Dr. Boardman married Althea McMaster, a schoolteacher, in 1883. She was the daughter of a pioneer settler in Oronoco Township. Althea died in 1903, leaving a fifteen-year-old son, Lees McMaster Boardman. Dr. Boardman married a second time and he was survived by the second wife and his son.

Joseph Bolton, an eclectic physician, was licensed in Minnesota by exemption. In his affidavit filed for the purpose of licensing, he stated that he started to practice in Otter Tail County in 1883 and continued through 1884 and part of 1885. He then practiced in Wilkins County from 1885 to 1887. He supposedly was in East Grand Forks in 1899. Minnesota Directories, however, do not list him between 1890 and 1898, but list his name in East Grand Forks in 1903 and 1905. Polk's Medical Directory does not show his name after 1906. It is not known where he settled after leaving East Grand Forks nor when or where he died.

Otis J. Brown was born in Dayton, Ohio, on April 13, 18.... He graduated from Western Reserve University in 1882 and was licensed in Minnesota, October 6, 1886 (License No. 1275). He came to Red Wing (Goodhue County) in 1885. He was president of the Red Wing Literary Society and was greatly interested in debating. Dr. Brown was county physician and stayed in Red Wing until 1898, when he moved to Crookston, where he practiced until at least 1900. In 1903, he is listed in St. Cloud and from 1905 on in Little Falls. He died on March 28, 1928.

George A. Cable is listed in Crookston in 1886 and in 1890. He graduated in 1873 from the University of Wooster, Medical Department, Cleveland, Ohio. Dr. Cable also practiced in Mentor and Fertile. He was also listed in Villard (Pope County) in 1890. In 1895 and 1898, he was in Minneapolis; in 1903 and 1905, in San Francisco, California. He received his license December 31, 1883 (License No. 692). He died October 10, 1908.

Magnus A. F. Carmentan (Cormotan) is listed in the "Official Register, Physicians in Minnesota, 1883-1890"; he was licensed as a "regular" physician (License No. 450-3) on December 19, 1883, at Fosston. He was licensed by exemption, and no school of graduation is known. Minnesota Directories list him at Pelican Rapids (Otter Tail County) in 1890 and at Fosston in 1895 as deceased.

Jackson S. Chapin was born in Highman, Wisconsin, January 13, 1856. He attended Bennet Medical College, Chicago, Illinois, and practiced in Ohio as assistant to a county doctor. He started practice in Euclid in 1882. He was not registered, but was allowed to continue his work at Euclid by virtue of his years of practice, qualifications and his long apprenticeship in Ohio. He was a kindly gentleman and very attentive to his patients. He was a widespread reputation for his care and success in treating typhoid. He died suddenly in 1925 at the home

of a patient for whom he was caring. His wife still survives him and is over 90 years old (1953). He is no doubt identical with Dr. G. S. Chapin listed in the "Official Register, Physicians in Minnesota, 1883-1890," with license No. 849-1.

Walter Clark is listed in Mentor in 1886, 1890 and 1893. This seems to be the only information available on Dr. Clark. He was not licensed in Minnesota.

Charles E. Dampier, a pioneer physician and surgeon in the northwest, was an eminent citizen of Crookston. He was a native of Canada, born in Waterloo, Province of Quebec, June 5, 1854. Two years later, his parents, Edward and Charlotte (Parmalee) Dampier, came to Minnesota. (Edward Dampier was born in Paris, but was of English parentage, and his wife was a native of Vermont.) They located in Stell County, in what is now Lamand township, in 1856, and were the second family of white settlers in that section. A few years later Edward Dampier moved to Meridian township, where he lived until 1862. In that year, he went to Dakota County and there rented a farm. He also resided for a time in Fergus Falls and Northfield. He was engaged in the hotel business in Northfield when the town was raided by the Younger Brothers, and it was from a window of his hotel that Dr. Wheeler shot Clell Miller, a member of the gang. Dr. Wheeler gained possession of the body of Clell Miller and when he returned to Medical School at the University of Michigan, he still had possession of this cadaver. The story, perhaps apochryphal, was that both Charles Dampier and Wheeler were asked whether each had material for anatomy. Dampier answered, "Yes, sir." The question passed on to Wheeler, who also answered, "Yes, sir." He was then asked, "Where did you get it?" Wheeler replied, "I had to go out and shoot one." After graduation, Dr. Dampier kept the gun and Dr. Wheeler had the skeleton of Clell Miller in a back closet at his office in Grand Forks, North Dakota, where it remained until recently when the place burned down. Edward Dampier served as first Lieutenant of his company which was detailed to detached duty in Minnesota during the Civil War. On receiving his honorable discharge in 1865, he returned to Dakota County and purchased a farm near Castle Rock. As an early settler of the state, he endured the hardships and trials of that time, a worthy citizen of the new commonwealth.

Charles Dampier, one of seven children, was reared in Minnesota and received his early education in the country schools. He completed his preparatory studies in an academy at Elgin, Illinois, and attended Carleton College. He began his professional studies in Northfield under Dr. C. L. Armington and, in 1876, entered the medical college of the University of Michigan, receiving his degree in 1878. He located at Dell Rapids, South Dakota, and practiced there for about six months, then returned to Minnesota and to Northfield. He was licensed to practice in Minnesota in 1883. In the following year, he went to Crookston where he enjoyed a successful practice. Dr. Dampier has never regarded his medical education as finished but continued his scientific studies and research, keeping in touch with the many developments and achievements of the medical world. He took several postgraduate courses, two of them in Chicago. He served for five years as councilor of the First District for the State Medical Association and was a member of the American Medical Association, and the Red River Valley Society. He received a number of important federal appointments. He was county examiner for the sanatorium at Walker, Minnesota, secretary of the Board of Pension Examiners, and for twenty-five years had been the city health officer. He held the position of local surgeon for the Northern Pacific Railroad twenty-five years. Aside from his professional duties, Dr. Dampier was identi-

fied with public interests as secretary and treasurer of the school board and as treasurer of the Building and Loan Association. He was a member of the Masonic fraternity, a Shriner and Past Eminent Commander of the Crookston Commandery and had been treasurer of the local chapters for more than thirty years. He was a charter member of the Elks' Lodge and had served as treasurer of that order for a number of years. He died February 20, 1923, at Bethesda Hospital, Crookston, at the age of sixty-eight.

Charles H. Denniston was graduated in 1875 from Bellvue Hospital Medical College, New York City. He was in Crookston as early as 1886 and was listed there in 1890 through at least 1909. He limited his work to medical work. He was a retiring gentleman, and never became well known. He was licensed December 28, 1883 (License No. 508). It is not known where or when he died.

Alexander H. Dunlop, one of the leading physicians and surgeons of Crookston, was eminently connected with the medical profession of the county from 1882, when he first engaged in practice in Crookston. He was born in Ontario, Canada, September 14, 1857. His father, John Dunlop, was a native of Ontario and his wife, Julia (Ellis) Dunlop, was born in Edinburgh, Scotland. John Dunlop was a lumber man and mill owner and lived in Canada throughout his life. Of their family of four sons and three daughters, Dr. Alexander Dunlop was the only one who did not reside in Canada. He was reared in that country and received his early education in the public schools and then became a student at Queens College at Kingston. After graduating from that institution in 1875, he began to prepare himself for the medical profession. He studied for a few months under Dr. Lafferty of Kingston, and in the winter of the same year he entered McGill College. In 1882, he received his degree and came to Crookston where he continued to pursue his professional duties. He became a citizen of the United States in the same year and was licensed in 1883. No small part of his success was due to years of keen study and a constant alertness to the rapid advances made in medical discoveries. Dr. Dunlop took postgraduate work each year, either in New York clinics or at McGill College. He was a member of the Minnesota Medical Association, the Red River Valley Medical Society and the American Medical Association.

Aside from his private practice, Dr. Dunlop held the position of local surgeon for the Great Northern Railroad for several years. He was married in 1912 to Annie Bolie, a native of Minnesota. Dr. Dunlop was a member of the Masonic order, the Modern Woodmen, and the Elk Lodge. He impressed one as being a keen mental type and was a good diagnostician. He did considerable surgery and was on the staffs of Bethesda and St. Vincent Hospitals. He had a large personal following, was "good company" and was endowed with a marked sense of humor. He died March 19, 1945, at the age of eighty-seven, a few years after he had retired, and was buried in Crookston. Dr. Dunlop left no children. His wife still lives in Crookston (1953).

Francis X. Farley settled in Crookston in 1886 and practiced medicine there until approximately 1910. He graduated in 1881 from the Michigan College of Medicine and was licensed in Minnesota in November, 1883. He left Crookston to retire about 1910. It is said that he moved to Los Angeles, California, in 1913, but he apparently did not practice there.

(To be continued in the July issue)

Minnesota State Medical Association

104th Annual Meeting

Saint Paul, Minnesota—May 13-15, 1957

Preliminary Program

BUSINESS SESSIONS

Saint Paul Hotel

SATURDAY, MAY 11

2:00 P.M.—Council....Windsor Room, Saint Paul Hotel
6:00 P.M.—Council....Windsor Room, Saint Paul Hotel

SUNDAY, MAY 12

8:30 A.M.—Council....Windsor Room, Saint Paul Hotel
10:00 A.M.—Reference Committees

Rooms to be assigned

2:00 P.M.—House of Delegates
Continental Room, Saint Paul Hotel

6:00 P.M.—New Members and County Officers Dinner
Mezzanine Ballroom, Lowry Hotel

8:00 P.M.—House of Delegates
Continental Room, Saint Paul Hotel

MONDAY, MAY 13

8:30 A.M.—Council....Windsor Room, Saint Paul Hotel
12:15 P.M.—House of Delegates

Continental Room, Saint Paul Hotel

TUESDAY, MAY 14

8:30 A.M.—Council....Windsor Room, Saint Paul Hotel
8:30 A.M.—Committee Breakfasts

Rooms to be assigned

WEDNESDAY, MAY 15

8:30 A.M.—Council....Windsor Room, Saint Paul Hotel
8:30 A.M.—Committee Breakfasts

Rooms to be assigned

SOCIAL EVENTS

SUNDAY, MAY 12

6:00 P.M.—New Members and County Officers Dinner
Mezzanine Ballroom, Lowry Hotel

6:30 P.M.—Golfers Dinner
White Bear Yacht Club, Dellwood

6:30 P.M.—Dinner.....Minnesota Chapter,
American College of Chest Physicians, Lowry Hotel

MONDAY, MAY 13

Luncheons

12:00 noon—American Medical Women's Association,
Minnesota Branch..Saint Paul Athletic Club

Dinners

6:00 P.M.—Minnesota Academy of General Practice.
Mezzanine Ballroom, Lowry Hotel.

6:00 P.M.—Minnesota Radiological Society.
Minnesota Club.

Open House

9:00 P.M.—Minnesota State Medical Association.
Continental Room, Saint Paul Hotel.

TUESDAY, MAY 14

Luncheons

12:15 P.M.—Minnesota Society of Clinical Pathologists.

Dinners

6:00 P.M.—Minnesota Society of Clinical Pathologists.
University Club.

7:00 P.M.—Minnesota State Medical Association,
Annual Banquet, Continental Room, Saint
Paul Hotel.

WEDNESDAY, MAY 15

Dinners

6:30 P.M.—University of Minnesota Class of 1939
Reunion. Minnesota Club.

ROUND TABLES

Saint Paul Hotel—12:15 P.M.

MONDAY, MAY 13

Broncho-esophageal Problems Including Foreign Bodies
COLEMAN J. CONNELLY, Saint Paul

Upper Gastro-Intestinal Hemorrhage

STANLEY R. MAXEINER, JR., Minneapolis

Urinary Tract Infections.....HAROLD J. WALDER, Duluth

Anticoagulants: Indications and Contraindications

SIDNEY O. HUGHES, Winona

Induction of Labor.....ALBERT F. HAYES, Saint Paul

Problems in Back Injuries.....D. L. MCCAIN, Saint Paul

Heart Disease Subject

CHARLES P. BAILEY, Philadelphia, Pa.

Medical Problems in Pregnancy

JAMES METCALFE, Boston City Lying-in
Hospital, Boston, Mass.

TUESDAY, MAY 14

Diagnosis of Chest Diseases

THOMAS J. KINSELLA, Minneapolis

Adrenal Steroids.....R. G. SPRAGUE, Rochester

The Dangerous Placenta

KERMIT E. KRANTZ, Assistant Professor of
Obstetrics and Gynecology, School of
Medicine, University of Arkansas, Little
Rock, Arkansas

Infertility, a Family Unit Problem

WILLIAM H. MASTERS, Associate Professor
of Obstetrics and Gynecology, Washington
University School of Medicine, St. Louis,
Missouri

Biliary Tract Disease.....W. J. FINKELNBURG, Winona

PRELIMINARY PROGRAM

Chronic Ulcerative Colitis and Regional Enteritis
B. M. BLACK, Rochester

Carcinoma *in situ* of the Uterine Cervix
ARTHUR T. HERTIG, Head, Department of Pathology, Harvard University Medical School, Boston, Mass.

Cancer Subject
C. P. RHOADS, Sloan-Kettering Institute for Cancer Research, New York, New York

WEDNESDAY, MAY 15

Diagnosis of Lesions of the Anus and Rectum
WILLIAM C. BERNSTEIN, Saint Paul

Practical Points in the Use of Digitalis
S. H. BOYER, JR., Duluth

Diarrhea.....PHILIP W. BROWN, Rochester

Role of Radio-iodine in Thyroid Disease
ELMER C. PAULSON, Saint Paul

The Discriminate Use of Chemotherapy
WESLEY W. SPINK, University of Minnesota

Acute Renal Failure.....HOWARD M. ODELL, Rochester

The Eyegrounds in Everyday Practice
VIRGIL J. SCHWARTZ, Minneapolis

GENERAL SESSION

Saint Paul Municipal Auditorium

MONDAY, MAY 13

Morning Session

Chairman: J. P. MEDELMAN

A.M.

8:30 Visit Scientific and Technical Exhibits

9:00 MINNESOTA HEART ASSOCIATION PANEL

Heart Disease in Pregnancy

RODNEY F. STURLEY, Saint Paul, Chairman
JOHN F. BRIGGS, Saint Paul, Moderator

Surgical Treatment of Pregnant Heart Cases

CHARLES P. BAILEY, Professor and Head, Department of Thoracic Surgery, Hahnemann Medical College, Philadelphia, Pa.

General Problems of the Heart in Pregnancy

JAMES METCALFE, Associate Physician, Boston City Lying-in Hospital, Boston, Mass.

Hypertension and Toxemia in Pregnancy

NICHOLAS S. AASLI, Associate Professor of Obstetrics and Gynecology, University of California Medical Center, Los Angeles, Calif.

Obstetrical Problems in Pregnant Heart Cases

IRWIN H. KAISER, University of Minnesota

Question and Answer period.

Intermission

11:00 RUSSELL D. CARMAN MEMORIAL LECTURE

Hiatus Hernia: Facts and Problems

PROF. DR. HANS HEINRICH BERG, Hamburg, Germany

Afternoon Session

Chairman: W. P. FINKELNBURG

P.M.

12:15 Miscellaneous Luncheons

12:15 Round Table Luncheons

1:30 Visit Scientific and Technical Exhibits

2:00 *The Acute Abdomen*—Panel Discussion
HENRY L. BOCKUS, Philadelphia, Pa., Moderator

Surgical Considerations in the Upper Abdomen
N. LOGAN LEVEN, Saint Paul

Surgical Considerations in the Lower Abdomen
HARRY B. NEEL, Albert Lea

Roentgenologic Aspects and Indications for Roentgenography

LEO G. RIGLER, University of Minnesota

Diagnostic Problems of the Acute Abdomen
J. C. CAIN, Rochester

Question and Answer period.

3:15 INTERMISSION

Visit Scientific and Technical Exhibits

4:00 *Iatrogenic Disorders in Gastroenterology*

HENRY L. BOCKUS, Professor and Chairman, Department of Medicine, University of Pennsylvania Graduate School of Medicine, Philadelphia, Pennsylvania

5:15 *Obstetric Manikin Demonstration*

KERMIT E. KRANTZ, Assistant Professor of Obstetrics and Gynecology, School of Medicine, University of Arkansas, Little Rock, Arkansas

5:15 Visit Scientific and Technical Exhibits

6:00 Special Dinners

9:00 Open House—Saint Paul Hotel

GENERAL SESSION

Saint Paul Municipal Auditorium

TUESDAY, MAY 14

Morning Session

Chairman: W. S. NEFF

A.M.

8:30 Visit Scientific and Technical Exhibits

9:00 *Functional Disorders*—A Symposium

Gastrointestinal Aspects

R. S. YLVISAKER, Minneapolis

Gynecology

E. A. BANNER, Rochester

Dermatology

F. T. BECKER, Duluth

Tension States

HARVEY O. BEEK, Saint Paul

Question and Answer period.

10:00 *Presidential Address*

J. A. BARGEN, Rochester

PRELIMINARY PROGRAM

Intermission

Visit Scientific and Technical Exhibits

11:00 ARTHUR H. SANFORD LECTURE

Essentials of Endometrial Pathology

ARTHUR T. HERTIG, Shattuck Professor of Pathological Anatomy and Head, Department of Pathology, Harvard University Medical School, Boston, Mass.

Afternoon Session

Chairman: B. M. BLACK

P.M.

12:15 Special Luncheons

12:15 Round Table Luncheons

1:30 Visit Scientific and Technical Exhibits

2:00 *Palliative Treatment of Cancer*—A Panel
C. P. RHOADS, New York City, Moderator

Use of Hormones—B. J. KENNEDY, University of Minnesota

By Neurosurgery
R. L. MERRICK, Saint Paul

Radiation Therapy
DONALD S. CHILDS, JR., Rochester

By Drugs
JOHN S. LUNDY, Rochester

Question and Answer period.

Intermission

Visit Scientific and Technical Exhibits

4:00 MINNESOTA DIVISION, AMERICAN CANCER SOCIETY LECTURE

Chemotherapy of Cancer

C. P. RHOADS, Director, Sloan-Kettering Institute for Cancer Research, New York, New York

5:15 *Obstetric Manikin Demonstration*
RUSSELL N. FRY, Minneapolis

5:15 Visit Scientific and Technical Exhibits

Tuesday Evening

7:00 Annual Banquet—Continental Room, Saint Paul Hotel
Presiding—J. A. BARGEN, Rochester

Introduction of Woman's Auxiliary President:
MRS. C. L. OPPEGAARD, Crookston

Presentation: Fifty-Club Certificates; Southern Minnesota Medical Association Medal; Distinguished Service Medal

Speaker: REAR ADMIRAL HYMAN G. RICKOVER, Washington, D. C.—“Energy Resources and Our Future”

GENERAL SESSION

Saint Paul Municipal Auditorium

WEDNESDAY, MAY 15

Morning Session

Chairman: R. P. BUCKLEY

A.M.

8:30 Visit Scientific and Technical Exhibits

9:00 NORTHWESTERN PEDIATRIC SOCIETY LECTURE

Endocrinopathies in Children

VINCENT C. KELLEY, Associate Professor of Pediatrics, University of Utah College of Medicine, Salt Lake City, Utah

9:40 MINNESOTA MEDICAL FOUNDATION LECTURE

The Practical Appraisal of Liver Function
CECIL WATSON, Professor and Head, Department of Medicine, University of Minnesota

Intermission

Visit Scientific and Technical Exhibits

11:00 *The Menopause and Therafter*
WILLIAM H. MASTERS, Associate Professor of Obstetrics and Gynecology, Washington University School of Medicine, St. Louis, Missouri

11:30 *Functional Disorders of the Nose*
C. STEWART NASH, Consultant to the Faculty, University of Rochester School of Medicine and Dentistry, Rochester, New York

Afternoon Session

Chairman: D. S. AMATUZIO

P.M.

12:15 Round Table Luncheons

1:30 Visit Scientific and Technical Exhibits

2:00 *Managment of Acute Injuries*—A Panel
CLAUDE HITCHCOCK, Minneapolis, Moderator

Shock
RALPH SMITH, Veterans Hospital, Minneapolis

Head Injuries
HAROLD BUCHSTEIN, Minneapolis

Chest Injuries
LYLE TONGEN, Saint Paul

Vascular Injuries
E. W. JOHNSON, JR., Rochester

Question and Answer period.

Woman's Auxiliary

35th Annual Meeting

PROGRAM

MONDAY, MAY 13, 1957

A.M.

- 9:00—*Registration*Mezzanine, Hotel Lowry
 9:30—*Transportation for Tour*
 Leave from Fourth Street entrance—Hotel Lowry

- 10:00—*Tour*Minnesota Mining Research Center
 10:45—*Executive Board Meeting*....Women's City Club

P.M.

- 1:00—*Executive Board Luncheon*....Women's City Club (\$2.25)
 2:45—*Transportation to Tea*
 Leave from Fourth Street entrance—Hotel Lowry
 3:00-4:30—*Tea*
 Home of Dr. and Mrs. Philemon Roy, 1 Raccoon Road, North Oaks, Minn.
 All visiting women are invited
 9:00—*Open House*....Continental Room, St. Paul Hotel
 Open to all visiting women and their husbands

TUESDAY, MAY 14, 1957

A.M.

- 9:00—*Registration*Mezzanine, Hotel Lowry
 9:30—*Annual Meeting*.....Fiesta Room, Hotel Lowry
 Open to all members of the Auxiliary
 Presiding—MRS. L. P. HOWELL, Rochester, President
 Pledge of Allegiance and Auxiliary Pledge—MRS. EZRA BRIDGE, Cannon Falls
 "I pledge my loyalty and devotion to the Woman's Auxiliary to the American Medical Association. I will support its activities, protect its reputation and ever sustain its high ideals."
 Address of Welcome—MRS. CHARLES FROATS, President, Ramsey County Medical Auxiliary
 Response—MRS. CHESTER THIEM, Mankato
 Presentation of Convention Chairmen—MRS. W. P. GARDNER and MRS. W. P. RITCHIE
 In Memoriam Service—MRS. CHARLES WASS, Saint Paul
 Reports
 Election of Officers

P.M.

- 1:00—*Annual Luncheon*
 Mezzanine Ballroom, Hotel Lowry
 Tickets \$2.25
 Installation of Officers—MRS. H. H. FESLER, Saint Paul
 Installation of President and Presentation of President's Pin—MRS. J. F. NORMAN, Saint Paul
 Presentation of Gavel
 Greetings from the New President—MRS. C. L. OPPEGAARD, Crookston
 Style Show presented by Schunemans of Saint Paul, MARY LIGHT, commentator

- 4:00—*Post Convention Board Meeting*

Fiesta Room, Hotel Lowry

- 7:00—*Annual Banquet*

Continental Room, St. Paul Hotel

- Presiding—J. A. BARGEN, Rochester
 Introduction of MRS. C. L. OPPEGAARD, Woman's Auxiliary President
 Presentation of Fifty Club Certificates
 Presentation of Southern Minnesota Medical Association Medal
 Presentation of Distinguished Service Medal
 Speaker—REAR ADMIRAL HYMAN G. RICKOVER, U. S. Navy, "Energy Resources and Our Future"

WEDNESDAY, MAY 15, 1957

A.M.

- 9:30—*Breakfast*Ramsey Room, Hotel Lowry
 (All visiting women guests of Ramsey County Medical Auxiliary)
Please Be Sure to Visit the Scientific and Technical Exhibits at the Saint Paul Municipal Auditorium

Committees

All members of the Ramsey County Medical Auxiliary
General Arrangements—Mrs. Walter P. Gardner and Mrs. Wallace P. Ritchie.

Registration—Mrs. J. P. Medelman, Chairman; Mrs. Don Derauf, Mrs. Leroy Fox, Mrs. John Madden, Mrs. Leo Nash, Mrs. O. I. Sohlberg.

Reservations—Mrs. John Meade.

Tickets—Mrs. L. T. Simons, Chairman; Mrs. Frank Babb, Mrs. Charles Eginton, Mrs. W. A. Gleason, Mrs. Donald Lannin.

Hospitality—Mrs. H. J. Wolff and Mrs. W. H. Von der Weyer.

Board Luncheon—Mrs. R. K. Grau, Chairman; Mrs. Alexander McEwan, Mrs. E. R. Sterner.

Tea—Mrs. Philemon Roy, Chairman; Mrs. Frank Adair, Mrs. Charles Fogarty, Jr., Mrs. M. Dudley Hilker, Mrs. Douglass Kusske, Mrs. B. G. Lannin, Mrs. James Ralph.

Annual Meeting—Arrangements, Mrs. Wallace Ritchie.

Annual Luncheon—Mrs. Walter Carley and Mrs. Eugene Scott.

Pages—Mrs. S. M. Loken, Chairman; Mrs. O. E. Enroth, Mrs. Benjamin F. Fuller, Mrs. John A. McNeill, Mrs. Albert G. Miller.

Breakfast—Mrs. H. O. Peterson, Chairman; Mrs. Frederick P. Army, Mrs. F. J. Bonello, Mrs. Louis A. Nelson, Jr.

Flowers—Mrs. Herbert Johnson and Mrs. Ralph L. Olsen.

Press—Mrs. Gerhard Knutson and Mrs. A. B. Rosenfield.

Music—Mrs. Robert W. Holman.

Tour and Transportation—Mrs. L. G. Culver, Chairman; Mrs. Carleton W. Leverenz, Mrs. Burtis J. Mears, Mrs. B. B. Souster.

Meetings and Announcements

TATE

MINNESOTA STATE MEDICAL ASSOCIATION, 64th annual meeting, Saint Paul, May 13, 14 and 15, 1957.

NATIONAL

American Congress of Physical Medicine and Rehabilitation, thirty-fifth annual scientific and clinical session, Los Angeles, September 8-13, 1957.

American Goiter Association, Hotel Statler, New York, New York, May 28-30, 1957. John C. McClintock, M.D., Secretary, 149½ Washington Avenue, Albany 10, New York.

Canadian Pediatric Society, Winnipeg, Manitoba, June 12-15, 1957. (Held in conjunction with the scientific opening of the Winnipeg Children's Hospital and with the Northwestern Pediatric Society.)

The Children's Hospital of Philadelphia. Three short refresher courses. "Pediatric Advances for Pediatricians and General Practitioners," May 27-31, 1957. "Practical Pediatric Hematology," June 3-5, 1957. "Blood Group Incompatibilities and Erythroblastosis Fetalis," June 6-7, 1957. Irving J. Wolman, M.D., Children's Hospital of Philadelphia, 1740 Bainbridge Street, Philadelphia 46, Pennsylvania.

First American Post-Graduate Assembly in Fertility and Sterility, New York Medical College-Metropolitan Medical Center, May 18-31. Dr. Ralph E. Snyder, Dean, New York Medical College, 1249 Fifth Avenue, New York 29, New York.

New York University Post-Graduate Medical School. Management of Chronic Kidney Diseases, June 24-25, Dr. Lawrence G. Wesson. Office of Associate Dean, New York University Post-Graduate Medical School, 550 First Avenue, New York 16, New York.

New York University Post-Graduate Medical School. Management of Hypertension, June 26-27, Dr. J. Marion Bryant. Office of Associate Dean, New York University Post-Graduate Medical School, 550 First Avenue, New York 16, New York.

Postgraduate Course on Gastroenterology, University of Colorado School of Medicine, Denver, Colorado, May 13-15, 1957. Co-sponsored by the American Gastroenterological Association. Office of Postgraduate Medical Education, University of Colorado Medical Center, 4200 East Ninth Avenue, Denver 20, Colorado.

University of Pittsburgh School of Medicine, Department of Surgery, Section of Anesthesiology—Postgraduate Symposium on the Basic Sciences Related to Anesthesiology, June 10-14, 1957. Write to Chairman of the Committee on Graduate Medical Education, Uni-

versity of Pittsburgh School of Medicine, 3941 O'Hara Street, Pittsburgh 13, Pennsylvania.

INTERNATIONAL

Canadian Medical Association, Edmonton, Alberta, Canada, June 17-21. Dr. A. D. Kelly, 150 St. George Street, Toronto 5, Ontario, Canada.

Congress of International Association for Study of the Bronchi, Lisbon, Portugal, May 25-26, Prof. F. Lopo de Varvalho, 138 rua de Junqueira, Lisbon, Portugal.

Congress of International Society for Cell Biology, St. Andrews, Fife, Scotland, August 28-September 3. Prof. H. G. Callan, Bell Pettigrew Museum, The University, St. Andrews, Fife, Scotland.

Congress of International Society of Orthopedic Surgery and Traumatology, Barcelona, Spain, September 16-21. International Society of Orthopedic Surgery and Traumatology, 34 rue Montoyer, Brussels, Belgium.

Congress of International Society of Surgery, Mexico City, Mexico, October 27-November 2. Dr. L. Dejardin, 141 rue Belliard, Brussels, Belgium.

Fourth International Poliomyelitis Conference, Geneva, Switzerland, July 8-12. Registration deadline, April 1. Fourth International Poliomyelitis Conference, Secretariat, Hotel du Rhone, Geneva, Switzerland.

Inter-American Congress of Pan American Medical Association, Mexico City, Mexico, November 18-22. Dr. Joseph J. Eller, 745 Fifth Avenue, New York 22, New York.

International Conference on Audiology, St. Louis, Missouri, May 13-16. Dr. S. Richard Silverman, 818 South Kingshighway, St. Louis, Missouri.

International Congress of Clinical Pathology, Brussels, Belgium, July 15-20. Prof. M. Welsch, Université de Liege, 32 Blvd. de la Constitution, Liege, Belgium.

International Congress of Dermatology, Stockholm, Sweden, July 31-August 6. Dr. C. H. Floden, Karolinska, Sjukhuset, Hudkliniken, Stockholm 60, Sweden.

International Congress of Electroencephalography and Clinical Neurophysiology, Brussels, Belgium, July 21-28. Dr. R. G. Bickford, Mayo Clinic, Rochester, Minnesota.

International Congress of International Society of Bronchoesophagology, Philadelphia, Pennsylvania, May 12-13. Dr. Chevalier L. Jackson, 3401 North Broad Street, Philadelphia.

International Congress on Medicine and Surgery, Turin, Italy, June 1-9. Secretariat, Minerva Medica, Corso Bramante 83-85, Turin, Italy.

International Congress of Neurological Sciences, Brus-

sels, Belgium, July 21-28. Dr. Pearce Bailey, National Institutes of Health, Bethesda 14, Maryland.

International Congress of Neurosurgery, Brussels, Belgium, July 21-28. Dr. William B. Scoville, 85 Jefferson Street, Hartford, Connecticut.

International Congress of Neuropathology, Brussels, Belgium, July 21-28. Dr. Ludo J. Bogaert, 47 rue de l'Harmonie, Antwerp, Belgium.

International Congress of Nutrition, Paris, France, July 24-29. Congress International de Nutrition, 71 Blvd. Pereire, Paris 17e, France.

International Congress of Otolaryngology, Washington, D. C., May 5-10. Dr. Paul H. Molinger, 700 North Michigan Avenue, Chicago 11, Illinois.

International Congress on Rheumatic Diseases, Toronto, Ontario, Canada, June 23-28. International Congress on Rheumatic Diseases, P.O. Box 237, Terminal "A," Toronto, Ontario.

International Gerontological Congress, Merano-Bolzano, Italy, July 14-19. Segreteria, Quarto Congresso Internazionale de Gerontologia, Viale Morgagni, 85, Firenze, Italy.

International League Against Epilepsy, Brussels, Belgium, July 21-28. Dr. Radermecker, Institut Bunge, 59 rue Philippe Milliot, Berchem, Antwerp, Belgium.

International Symposium on Medical-Social Aspects of Senile Nervous Diseases, Venice, Italy, July 20-21. Secretariate, Viale Morgagni 85, Firenze, Italy.

International Voice Conference (Laryngeal Research Function and Therapy), Chicago, Illinois, May 20-22. Dr. Hans von Leden, 30 North Michigan Avenue, Chicago 2, Illinois.

Neuroradiologic Symposium, Brussels, Belgium, July 21-28. Professor Melot, Hôpital Universitaire St. Pierre, Brussels, Belgium.

Pan-Pacific Surgical Association, seventh congress, Honolulu, Hawaii, November 14-22, 1957. Write Dr. F. J. Pinkerton, director-general of the Pan-Pacific Surgical Association, Room 230, Young Building, Honolulu, Hawaii.

Third International Medical-Surgical Meeting, Torino, Italy, June 1-9, 1957. Includes four international congresses (International Congress on Nuclear Medicine, International Congress on Photobiology, and International Congress on the Problems of the Goitre), seven national congresses (on chemotherapy, gastroenterology, surgery), ten symposia (European Society of Cardiovascular Surgery, Symposium on Artificial Heart-Lung Machines), and many meetings on the various medical and surgical specialties. Write: Secretary-General, Minerva Medica, Corso Bramante 83-85, Torino, Italy.

William Harvey Tercentenary Congress, Royal College of Surgeons, London, England, June 3-7, 1957. Dr. D. Geraint James, Harveian Society of London, 11 Chandos Street, Cavendish Square, London W. 1, England.

NEW YORK UNIVERSITY POST-GRADUATE MEDICAL SCHOOL ANNOUNCES COURSES

Spring and early summer postgraduate courses to be held at the New York University Post-Graduate Medical School are as follows:

Anesthesiology—full time—May 6-31.

Cardiology—full time—May 6-24.

Orthopedics in General Practice—full time—June 10-12.

Symposium on Modern Therapeutics in Internal Medicine—full time—June 10-21.

Management of Chronic Kidney Disease—full time—June 24-25.

Management of Hypertension—full time—June 26-27.

Further information may be obtained from the Office of the Associate Dean, Post-Graduate Medical School, 550 First Avenue, New York 16, New York.

SYMPOSIUM ON ALCOHOLISM

"The Treatment of the Alcoholic" will be the theme of a symposium on alcoholism for physicians to be held at the Center for Continuation Study, University of Minnesota, May 23-24, 1957, under the joint sponsorship of the University and the Minnesota Department of Health.

Dr. Lorant Forizs, medical director of the Florida Alcoholic Rehabilitation Program, will speak on motivating the alcoholic patient and group treatment of alcoholics. Dr. R. Gordon Bell, director of the Bell Clinic, Willowdale, Ontario, will talk on the nature of alcoholism and the use of drugs in follow-up treatment. Dr. Bell is one of the developers of Temposil, a new drug to help alcoholics remain away from alcohol. Dr. Vernelle Fox, medical director of the Georgian Clinic, Atlanta, Georgia, will speak on the use of the ataractic drugs in the therapy of alcoholism.

Registration is limited and a \$5.00 fee will be charged. The conference is open to all physicians. Applications may be secured from the Center for Continuation Study, University of Minnesota, Minneapolis 14, Minnesota.

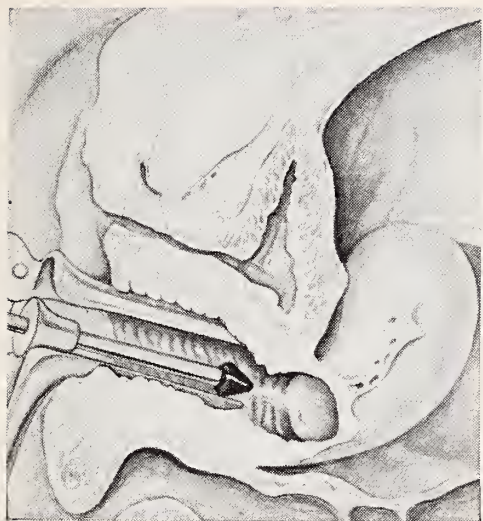
FOURTEEN FELLOWSHIPS IN PSYCHIATRY ANNOUNCED

The American Psychiatric Association has announced the award of fourteen fellowships in psychiatry, sponsored by the Smith, Kline & French Foundation, an independent philanthropic arm of Smith, Kline & French Laboratories, pharmaceutical manufacturers. The fellowships, which are administered by a committee named by the American Psychiatric Association, were established because it was believed that it is essential to bring new knowledge of therapies, techniques and practices to bear on the treatment and care of patients in public mental hospitals and schools for the retarded, and that there is a dire need for recruitment of a vast new corps of psychiatrists.

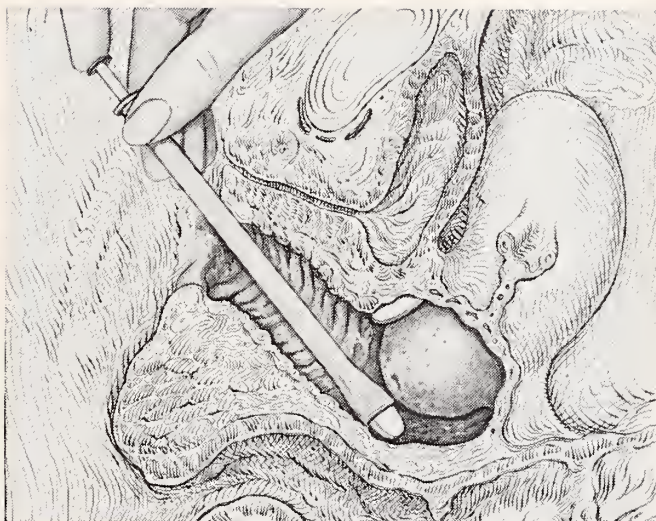
Seven main types of fellowships are available: support for advanced training for full-time staff psychiatrists of public mental hospitals and schools for the retarded;

(Continued on Page A-38)

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*Williamson, P.: Trichomonad Infestation, M. Times 84:929 (Sept.) 1956.

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FOURTEEN FELLOWSHIPS IN PSYCHIATRY ANNOUNCED

(Continued from Page 288)

awards to hospitals for visiting lectureships and for teaching fellowships; support for medical schools, teaching centers, et cetera, for extension training programs; student fellowships to encourage talented medical students to engage in summer activities in psychiatry, with the aim of drawing them into psychiatry as a life work; medical fellowships to encourage broadened skill in psychiatric problems of everyday practice by physicians other than psychiatrists; foreign scholar lectureships to bring outstanding men to the United States; and residency training fellowships under unusual circumstances.

One of the grants made is to the University of Minnesota Medical School to permit two medical students to receive support for an eight-week period between their junior and senior years while being attached to the Child Psychiatry Service of University Hospitals. Another grant is to the Mayo Clinic to permit three students at the University of Minnesota Medical School to participate in the psychiatric program at the Mayo Clinic for ten weeks in the summer of 1957 and become acquainted with various aspects of clinical psychiatry. The students chosen are Messrs. Charles V. Allen, Robert R. Rynearson, and James William Larson.

Further information on these fellowships may be obtained from the Fellowship committee, P.O. Box 7929, Philadelphia, Pennsylvania.

NATIONAL HEARING WEEK, MAY 5-11

National Hearing Week, sponsored by the American Hearing Society, will be held from May 5-11. In announcing this special week, the American Hearing Society hopes to alert the public to the problems of hearing loss and to the importance of efforts to prevent deafness, conserve hearing, and, when these fail, rehabilitation. It is estimated that there are 15 million hard of hearing persons in the United States, three million of whom are young children. Because impaired hearing is not a "visible" handicap, the average citizen is not aware that nearly one in ten of his fellow Americans suffers from some degree of hearing loss.



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In Memoriam

KENNETH E. FRITZELL

Dr. Kenneth E. Fritzell, prominent Grand Forks, North Dakota, surgeon, formerly of Minneapolis, died February 19, 1957, in Boston, Massachusetts, where he had undergone heart surgery. He was forty-nine years old.

Born in Minneapolis, Dr. Fritzell graduated from the University of Minnesota Medical School in 1931. He was a resident fellow in surgery at the University and at Minneapolis General Hospital. He practiced in Minneapolis from 1935 until he entered the U. S. Navy in 1942.

Dr. Fritzell joined the staff of the Grand Forks Clinic following his discharge from service in 1946 with the rank of commander.

He was a member of the staffs of Deaconess and St. Michael's Hospitals in Grand Forks, serving as chief of staff at Deaconess from 1951 through 1954.

He belonged to the North Dakota State Medical Association and the American Medical Association.

Dr. Fritzell had also been a member of the Hennepin County Medical Society, the Minnesota State Medical Association and was on the staffs of Abbott and Northwestern Hospitals in Minneapolis.

BYRL R. KIRKLIN

Dr. Byrl R. Kirklin, retired member of the Mayo Clinic staff, and one of the country's most prominent radiologists, died March 3, 1957, in Rochester. He was sixty-eight years old.

Born in Gaston, Indiana, Dr. Kirklin received his medical education at the University of Indiana College of Medicine. He took postgraduate work in radiology at the Mayo Clinic and joined the staff in 1926. He was named head of the diagnostic roentgenology department in 1930.

He was well known for his work as secretary of the Advisory Board for Medical Specialties and also as secretary of the American Board of Radiology. He served many years as a member of the AMA House of Delegates as a delegate from the Section on Radiology. He served as vice chairman of this section in 1936 and as chairman in 1937.

Dr. Kirklin was a professor emeritus of the University of Minnesota graduate medical school and had served as director of its Division of Radiology. He was also chairman of the Minnesota Advisory Committee to Selective Service for state dentists, physicians and veterinarians.

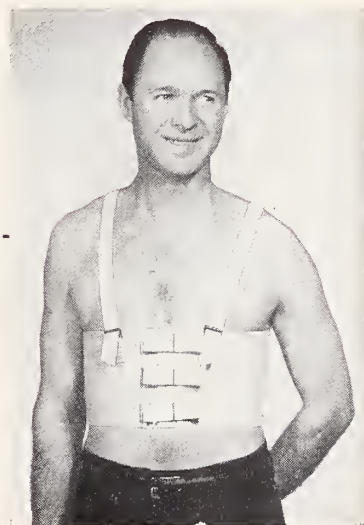
In addition to his activities in the American Medical Association, Dr. Kirklin was a member of the Zumbro Valley Medical Society and the Minnesota State Medical Association.

He is survived by his widow; one son, Dr. J. W. Kirklin, a heart surgeon at the Mayo Clinic, and one daughter, Mrs. Karl Ladner, Rochester.

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General Interest

The staff of St. Joseph's Hospital, Brainerd, has elected **Dr. William E. Fitzsimons** chief of staff for 1957. Vice chief of staff is **Dr. Helen W. Longfellow**, and **Dr. Arden O. Anderson** was chosen secretary-treasurer.

* * *

Dr. John F. Lewis, Minneapolis, addressed a dinner meeting of the Washington state chapter of the American Cancer Society on February 27, and presented a report on cancer surgery before the American College of Surgeons meeting, February 28 through March 2 at Seattle, Washington.

* * *

Clarkfield is the new address of **Dr. Suad Niazi**, who took over his duties at the clinic there February 4. He has spent the past eight or nine years at University Hospitals, Minneapolis, and Ancker Hospital, St. Paul.

* * *

The *Minneapolis Star* on February 12 carried a colored picture story of the open heart surgery performed at University Hospital by **Drs. C. Walton Lillehei, Richard L. Varco** and others, on a two-year-old French girl brought to the University for that purpose.

* * *

Dr. John J. Bittner, University of Minnesota cancer biologist, was selected as the recipient of the 1957 Bertner Foundation award presented annually by the University of Texas M.D. Anderson Hospital and Tumor Institute, Houston, Texas. The award was presented on March 8, at which time **Dr. Bittner** delivered the Bertner Foundation lecture on "Studies on Mammary Cancer in Mice and Their Implications for the Human Problem." **Dr. Bittner**, who is George Chase Christian professor of cancer research and director of the division of cancer biology at the University of Minnesota Medical School's pathology department, was cited for his "inspirational research on the factors involved in the origin of mammary cancer in mice."

* * *

The March meeting of the Minnesota Academy of Occupational Medicine and Surgery was held at the Calhoun Beach Hotel, Minneapolis, March 12, in conjunction with the Minnesota Occupational Health Nurses. Guest speakers were **Dr. A. E. Ritt** and Miss Cathryn Smith, who talked on "What the Nurses Expect of the Doctor."

* * *

The Minnesota Society of Neurology and Psychiatry held its March meeting at the Town and Country Club in St. Paul, Tuesday, March 12. The scientific program consisted of papers by **Dr. Richard Teeter** on "Body Image and Physician Symptoms," and **Dr. Ian Brown** on "Brain-Liver Relationships."

* * *

Dr. Merrill Chesler was the principal speaker at the February 5 meeting of the Third District Minnesota

Nurses Association held at the Glen Lake Sanatorium. His lecture on "Burn Therapy" was part of a refresher course in preparation for Civil Defense.

* * *

Jasper is the new location of **Dr. Frank Boyd**, who comes to that community to practice after two years spent in Edgerton, Wisconsin. **Dr. Boyd** is a graduate of the Harvard Medical School.

* * *

Dr. John F. Briggs, clinical associate professor of medicine at the University of Minnesota, was the speaker on March 4 at the Groveland Park school, where he addressed the child psychology study unit on "Emotions and Their Effect on the Heart."

* * *

Dr. Fred W. Behmler of Morris, now serving the second half of his four-year term as senator in the Minnesota legislature, is the only physician in that governmental body.

* * *

The community of Gilbert paid tribute on February 3 to **Dr. Moses Strathern**, pioneer doctor in that area. The celebration was held in the First Presbyterian Church, of which **Dr. Strathern** is a long-time elder. He was named as Gilbert's outstanding citizen in 1950, and is a member of the "Football Greats" at the University of Minnesota.

* * *

Dr. C. W. Truesdale, Glencoe, was elected chief of the medical staff at the Glencoe Hospital. **Dr. Arthur Neumaier** was selected as assistant chief, and **Dr. Maurice McNeil** as secretary-treasurer.

* * *

Among the speakers at the short course for internal medicine specialists held at the University of Minnesota's Center for Continuation Study, March 4-6, were **Dr. Max B. Lurie**, Philadelphia, Pennsylvania pathologist, and **Dr. Carleton B. Chapman**, professor of medicine, Southwestern Medical School, Dallas, Texas.

* * *

Dr. Gordon R. Kamman, St. Paul, attended the International Symposium on the Reticular Formation of the Brain, held at the Henry Ford Hospital, Detroit, Michigan, March 14-16.

* * *

Approved residences in Physical Medicine and Rehabilitation are available at the New York University-Bellevue Medical Center, beginning July 1, 1957. American graduates with approved internships are eligible for OVR Fellowship, with a stipend of \$3,400 per year, with an added dependency allotment. Application should be made immediately to **Dr. Joseph G. Benton**, Institute of Physical Medicine and Rehabilitation, 400 East 34th Street, New York 16, New York.

* * *

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(Continued on Page A-42)

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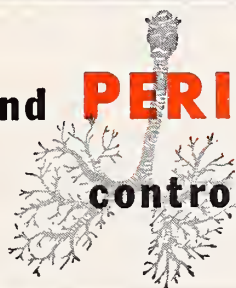
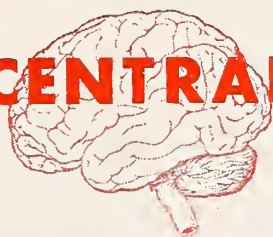
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(Continued from Page A-40)

Veterans Administration Hospital at Fort Snelling are tracing the mechanism by which a cancer-causing chemical enlarges the liver and inhibits body growth. The American Cancer Society has been supporting the work of **Dr. Helmut R. Gutmann**, on the physiological chemistry staffs of the University and VA hospitals; **Dr. Dorothy Filbin**, staff member at the Veterans Administration Hospital; and **Dr. John H. Peters**, formerly with the VA Hospital, but now with the Medical Research Institute, Christ Hospital, Cincinnati, Ohio. This group has been studying the growth inhibiting effect of acetylaminofluorene (AAF), a chemical causing liver cancer in rats.

* * *

Mediclinics of Minnesota, a postgraduate medical refresher course, was held in Fort Lauderdale, Florida, from March 4-14, 1957, under the sponsorship of the Florida Academy of General Practice. Faculty members from the University of Minnesota included: **Drs. Harold F. Buchstein**, clinical associate professor of neurological surgery; **Harry B. Hall**, clinical associate professor of orthopaedic surgery; **Arthur C. Kerkhof**, clinical associate professor of medicine; **Francis W. Lynch**, clinical professor of dermatology; **Ames W. Naslund**, clinical instructor in radiology; **O. L. Norman Nelson**, clinical instructor of medicine; **Owen F. Robbins**, clinical instructor of obstetrics and gynecology; **Albert V. Stoesser**, clinical professor of pediatrics; **Robert J. Tenner**, clinical

assistant professor of surgery; **Richard L. Varco**, professor of surgery; and **Edgar A. Webb**, clinical assistant professor of surgery. **Mr. Thomas P. Cooke**, executive secretary, Hennepin County Medical Society, also participated.

* * *

Dr. Max B. Lurie, professor of experimental pathology, Henry Phipps Institute, Philadelphia, Pennsylvania, delivered the annual **C. M. Jackson Memorial Lecture** at the University of Minnesota in March. The annual lecture is dedicated to Dr. Jackson who was head of the department of anatomy at the University of Minnesota Medical School until his death in 1948.

* * *

The first joint meeting of the 14th Judicial District Bar Association and the Red River Valley Medical Association was held recently. Purpose of the meeting was to foster better understanding of mutual problems. A motion picture on medical testimony was shown.

* * *

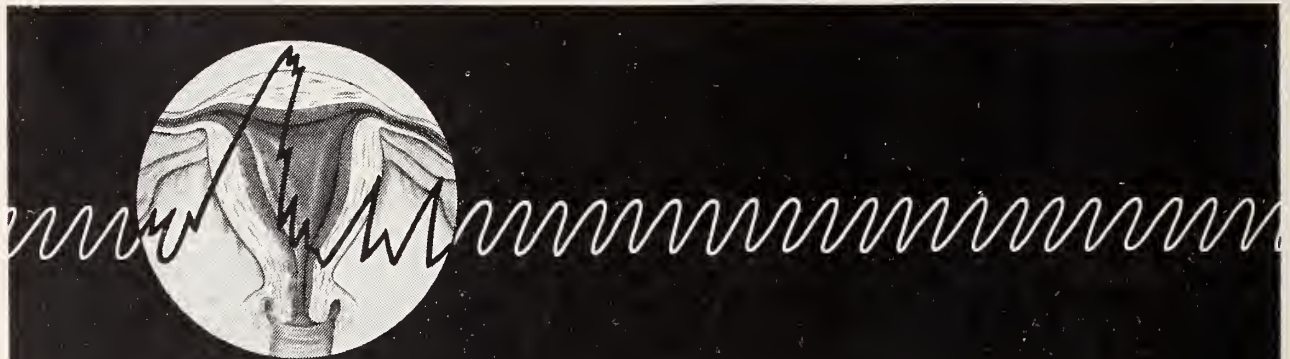
Mr. G. Ray Higgins, executive secretary of the Minnesota Heart Association, has resigned to become national assistant executive secretary of the American College of Physicians with headquarters in Philadelphia.

* * *

A number of Minneapolis physicians and their wives attended the February meeting of the Northwest Medical Association in Sun Valley, Idaho. Among those who

(Continued on Page A-44)

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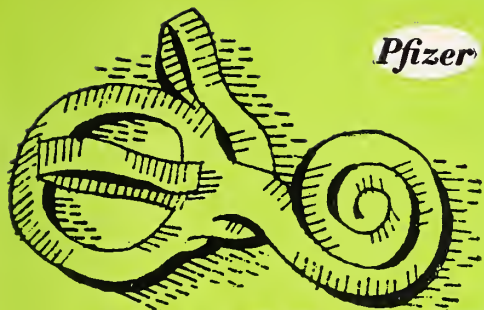
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(Continued from Page A-42)

attended with their families were Drs. Neil Palm, Konald Prem, Kenneth Romness, Lloyd F. Sherman, Charles F. Kelly, Jr., and Richard C. Tucker.

* * *

Physicians and lawyers from Kandiyohi, Meeker and Swift counties held a joint meeting recently at the Willmar Golf Club. The speakers at the medical-legal symposium were Dr. Gordon Kamman and Attorney Charles Murnane, both of St. Paul.

* * *

Dr. John S. Lundy, Rochester, is visiting U. S. Army medical installations in the Mid-West and Southwest at the invitation of the surgeon of the Fifth Army. He has also recently attended a meeting of the board of directors of the Anesthesia Memorial Foundation in Chicago and has participated in a mid-winter refresher course of the American Society of Anesthesiologists, also in Chicago.

* * *

Dr. O. B. Fesenmaier, New Ulm, has purchased the practice of the late Dr. F. H. Dubbe and has moved into the offices of Dr. Dubbe at 3½ North Minnesota in New Ulm.

* * *

Dr. Alton C. Olson and Dr. Howard L. Horns are members of the new board of directors of Doctors Memorial Hospital, Minneapolis.

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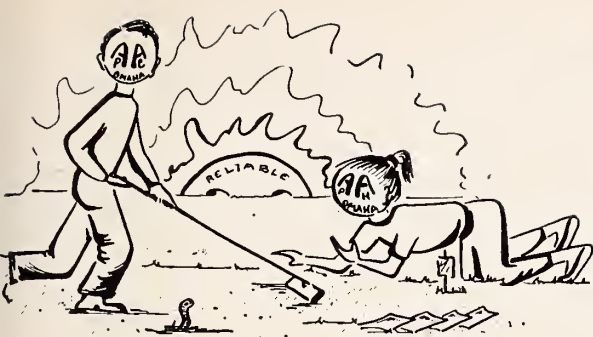
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The Minnesota Blue Shield Board of Directors has initiated the creation of a Physicians Review Committee of practicing physicians, which will serve the purpose of reviewing unusual claims and making recommendations regarding them.

The Physicians Review Committee is to consist of twelve members, one from each of nine specialty organizations and two from the Minnesota Academy of General Practice, and the President of Minnesota Blue Shield, who will serve as chairman. Each of these organizations has been requested to elect or appoint the member or members and alternate members to serve on this committee.

Other Blue Shield Plans, and the practicing physicians in the areas served by them, have found such committees very effective not only in solving the problems involved in unusual claims but in providing practicing physicians with a broader knowledge and understanding of Blue Shield affairs and activities.

Up to the date of this release, members and alternate members of all but two of the organizations have been elected or appointed and it is anticipated the remaining members and alternates will be selected in the near future. Work of the committee will be started as soon as the full membership has been selected.

January Blue Cross activity resulted in a payment of 99,862 days of hospital care for 16,752 participant subscribers compared to 86,830 days for 14,562 participant subscribers during January, 1956.

While the major part of this increase in utilization is attributable to the increase in the number of contracts in effect, increased incidence rate was experienced in accident care and non-surgical illnesses during January, 1957 compared with January, 1956. These figures might possibly indicate a continuing trend in the increase of accidents among Blue Cross subscribers.

Figures contained in the 1956 annual Blue Cross report reveal that during 1956, 30,069 accident cases were paid compared with 25,524 cases paid during the preceding year.


This increase in cases resulted in approximately \$500,000 in benefits paid for Minnesota Blue Cross subscribers.

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MINNEAPOLIS WOMAN SENTENCED TO FOUR-YEAR TERM FOR ABORTION ATTEMPT

Re: State of Minnesota vs. Alida Toivonen

On January 4, 1957, Alida Toivonen, fifty-eight years of age, 416 21st Ave. N., Minneapolis, was sentenced to a term of not to exceed four years in the Women's Reformatory at Shakopee, Minnesota, by the Hon. Levi M. Hall, Judge of the District Court of Hennepin County, pursuant to her plea of guilty to a charge of attempted abortion. The defendant had also entered a plea of guilty to an information charging her with having two prior felony convictions. However, Mrs. Toivonen had indicated to the Court that she desired to leave Minneapolis and go to Hot Springs, Arkansas, to live and Judge Hall therefore stayed the execution of the sentence for a period of four years on condition that she leave the State of Minnesota. Judge Hall gave the defendant five days in which to leave the State of Minnesota and placed her on probation with the Hennepin County Probation Office for the sole purpose of making certain that she left the state within five days. Notwithstanding the fact that the defendant has two prior convictions for abortion, Judge Hall was unwilling to order the defendant to serve her sentence.

The defendant was arrested after the authorities learned that a Golden Valley, Minnesota, mother of a seventeen-year-old-girl had secured the services of Mrs. Toivonen in aborting her pregnant daughter. Although Mrs. Toivonen was paid the sum of \$100.00 for her services, the patient did not abort and she later married the young man who was responsible for her pregnancy.

Mrs. Toivonen has two prior convictions for the crime of abortion. On February 13, 1945, Mrs. Toivonen entered a plea of guilty to an information charging her with that crime and she was sentenced by the Hon. Paul W. Guilford, Judge of the District Court of Hennepin County, to a term of one year in the Minneapolis Workhouse. However, she was released from the workhouse after serving six months of her sentence, when she was placed on probation for eighteen months. On October 7, 1947, Mrs. Toivonen again entered a plea of guilty to an abortion charge before the Hon. E. A. Montgomery, Judge of the District Court of Hennepin County, at which time she was sentenced to a term of not to exceed four years in the Women's Reformatory at Shakopee. However, Judge Montgomery stayed the execution of the sentence and placed the defendant on probation. Mrs. Toivonen, who was born in Yellow Medicine County, Minnesota, on March 8, 1898, holds no license to practice any form of healing in the State of Minnesota. However, she claimed that she had taken a correspondence course in nursing and worked in a small hospital in Wisconsin as a practical nurse.



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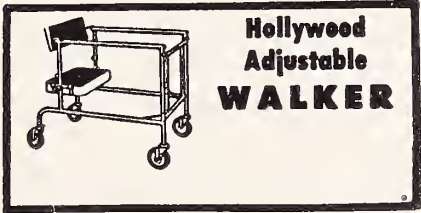
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Original Contributions

Surgical Aspects of Coronary Heart Disease

JOSEPH J. GARAMELLA, M.D.
Minneapolis, Minnesota

THE SURGICAL treatment of coronary artery disease perhaps lends itself more to prophecy than to presentation of past accomplishments. Ideally, the ultimate goal and treatment should be the prevention and/or reversal of the arteriosclerotic process. Unfortunately, this goal does not appear to be within immediate grasp. A further understanding of immunologic processes may permit the transplant and substitution of whole organs such as the heart. Recent advances in extracorporeal heart-lung apparatuses and elective cardiac arrest may render surgery on the coronary vessels such as endarterectomy and direct anastomoses, more practical. The future appears promising but nevertheless does not fulfill the current need for a surgical method of treating the nation's number one killer.

Incidence and Prognosis.—According to the statistics of the United States Public Health Service¹ 373,597 persons died of arteriosclerotic heart disease in 1953, the most common cause of death in the United States. This figure exceeded that for deaths due to cancer, the second most common cause of death, by more than 100,000. Approximately every ninety seconds, death due to coronary disease occurs in the United States, a nation whose population roughly comprises one-sixth of the world population.

The mortality rate in acute coronary occlusion is between 15 and 25 per cent. Life expectancy after recovery varies greatly, and the average duration of life is said to be about three to four years.² According to Silber and Katz,³ of those surviving the initial attack, 50 per cent survived

five to twenty years and three-fourths of these lived ten to twenty years. Stated differently, 50 per cent of those surviving the initial attack succumb in five years and 62.5 per cent in ten years. The potential malignancy of the disease is apparent.

Historical Aspects of Surgical Treatment.—In 1916 Jonnesco⁴ on the basis of speculative reasoning of Francois Franck⁵ performed bilateral stellate ganglionectomy to relieve angina. Since that time numerous other experimental and clinical methods have undergone trial and fundamentally these fall into the following categories:

1. Nerve interruption
2. Reduction of basal metabolism
3. Development of collateral circulation by vascular grafts
4. Development of collateral circulation from cardio-pericardial adhesions
5. Development of existing anastomotic channels
6. Local resection of pathologic lesions

A discussion of the various surgical methods is not within the scope of this presentation.

Evaluation and Interpretation of Results.—One of the barriers to the acceptance and clinical application of experimental methods has been the inconstancy of results reported by various investigators relative to the principal test method, coronary artery ligation with comparison of mortality and infarcts in control and test animals. Considering the multiple variables in such an operative procedure, this variation in results is not difficult to understand. Furthermore, the application of test procedures to normal animal hearts rather than hearts with varying degrees of chronic occlusion which simulate human heart disease has been offered as a criticism of experimental studies. Our own experiments following acute and chronic oc-

From the Jay C. Phillips Research Laboratory, Mount Sinai Hospital and Department of Surgery, University of Minnesota, Minneapolis, Minnesota.

Supported in part by grants from the Minnesota Heart Association, American Heart Association, and the Cardiac Research Committee, Minneapolis, Minnesota.

clusion⁶ have demonstrated, in terms of coronary arteriography in the intact animal and peripheral coronary pressures distal to occluded points, that the development of collateral coronary circulation

vessels, the physiologic need produced by coronary artery occlusion is removed by the intercoronary collateral circulation. These data, however, may not apply during periods of cardiac strain.

Modified Cardiopneumopexy Employing Segmental Resection

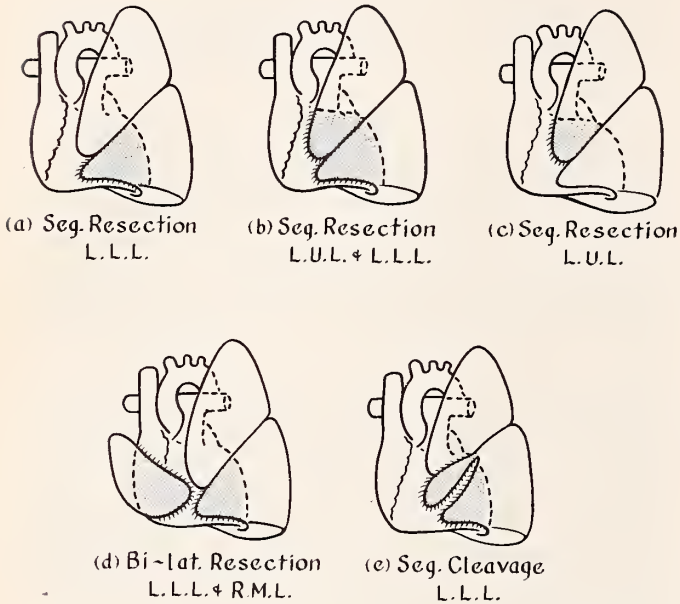


Fig. 1. Schematic representations showing variations of segmental resection and segmental cleavage for modified cardiopneumopexy.

Modified Cardiopneumopexy Employing Segmental Resection, Arterialization and Venous Obstruction

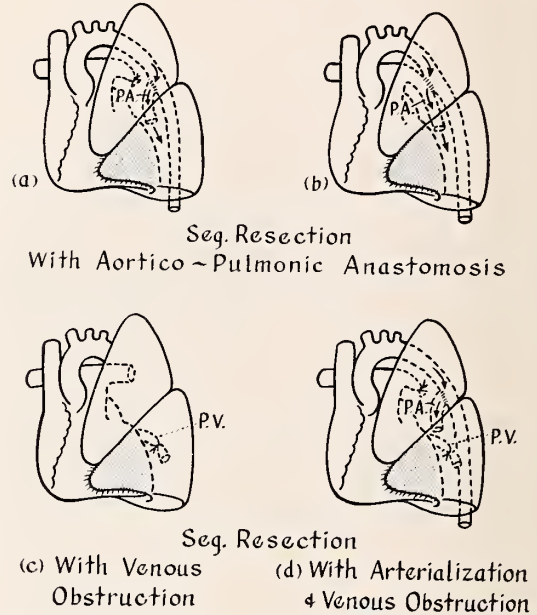


Fig. 2. Schematic representations of segmental resection for modified cardiopneumopexy combined with aorticopulmonic anastomosis and with pulmonary vein obstruction.



Fig. 3 (a) and (b). Heart-lung specimens following modified cardiopneumopexy with segmental resection showing the left lower lobe (lower right) fixed to the myocardium. Cannulae and tubing were used for injection studies. (c) Bivalved heart-lung specimen following modified cardiopneumopexy with segmentectomy showing firm union between the structures. Cannulae and tubing were used for injection studies.

soon restores the pressures in the occluded coronary arteries to levels equal to those of unoccluded neighboring arteries. Thus, regarding pressure gradients between coronary and extraordinary

Modified Cardiopneumopexy Employing Pulmonary Segmental Resection.—Of the many experimental and clinical studies regarding augmentation of the coronary blood supply, the protective

benefits of cardiopneumopexy as reported by Lezius⁷⁻¹⁰ following the concept of Beck¹¹ were among the most outstanding. Experimental and clinical cardiopneumopexy has been reported by others.¹²⁻¹⁸

With the concept that the broad, vascular surface of one or more segments of the lung applied to the heart might provide greater protective bene-

Air-Saline Injection

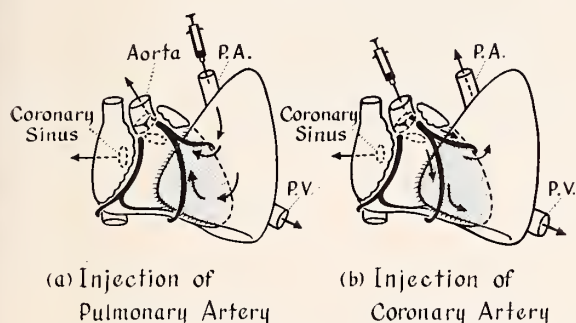


Fig. 4. Schematic drawings showing results of air-saline injections in heart-lung specimens following modified cardiopneumopexy with segmental resection. (a) Injection into the pulmonary artery shows fillings of coronary arteries and coronary veins with emptying into the aorta, coronary sinus and pulmonary vein. (b) Injection of the coronary artery shows filling of pulmonary arteries and veins and coronary sinus.

Directional Flow Study

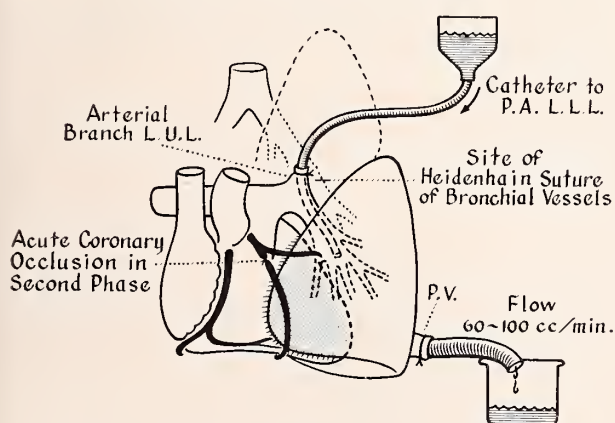


Fig. 6. Schematic drawing of experimental arrangement for directional flow study. Catheter attached to perfusion bottle is threaded through upper lobe artery to distribution area of left lower lobe previously treated by segmental resection and grafted to myocardium. The inferior pulmonary vein is diverted to a beaker at level of left atrium. A Heidenhain suture for obstruction of bronchial vessels is placed around the lower lobe bronchus. The perfusion is then conducted in two stages without and with coronary artery occlusion.

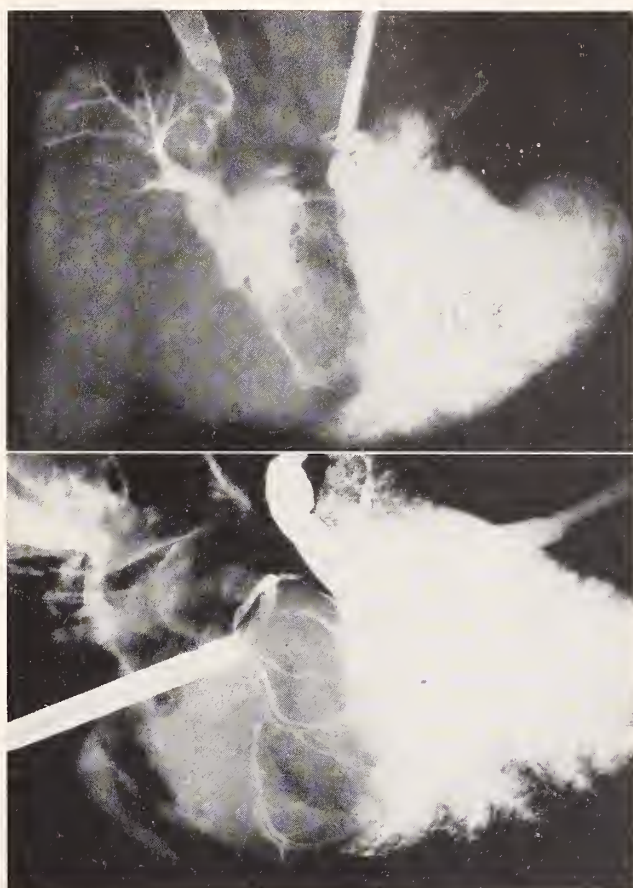


Fig. 5 (a). Heart-lung specimen obtained from animal dying on seventh postoperative day following cardiopneumopexy with bilateral segmentectomy through transverse sternotomy. Cause of death was atelectasis and empyema. Injection of contrast media into pulmonary artery shows filling of coronary arteries and coronary veins. Failure to cannulate one tributary of the inferior pulmonary vein allowed reflux filling of the left atrium and right pulmonary tree. (b) Heart-lung specimen 41 days following cardiopneumopexy with segmental resection of left lower lobe. Injection of contrast media (sodium Hypaque) into pulmonary artery shows filling of coronary arteries and veins. Cannulae in coronary sinus (left side) and in pulmonary vein (right upper corner) also contain dye.

fits to the ischemic heart than the previously described methods of cardiopneumopexy, various combinations of pulmonary segmental resection and segmental cleavage have been explored experimentally with and without arterialization and venous obstruction of the grafted lobe (Figs. 1 and 2). Excellent heart-lung union was a constant feature of the operations (Fig. 3a, b, c) and anastomoses between the heart and the lung were consistently demonstrated by injection studies (Figs. 4 and 5a, b). Directional blood flow studies were performed in twenty animals previously prepared by modified cardiopneumopexy with segmental resection and segmental

Directional Flow Study

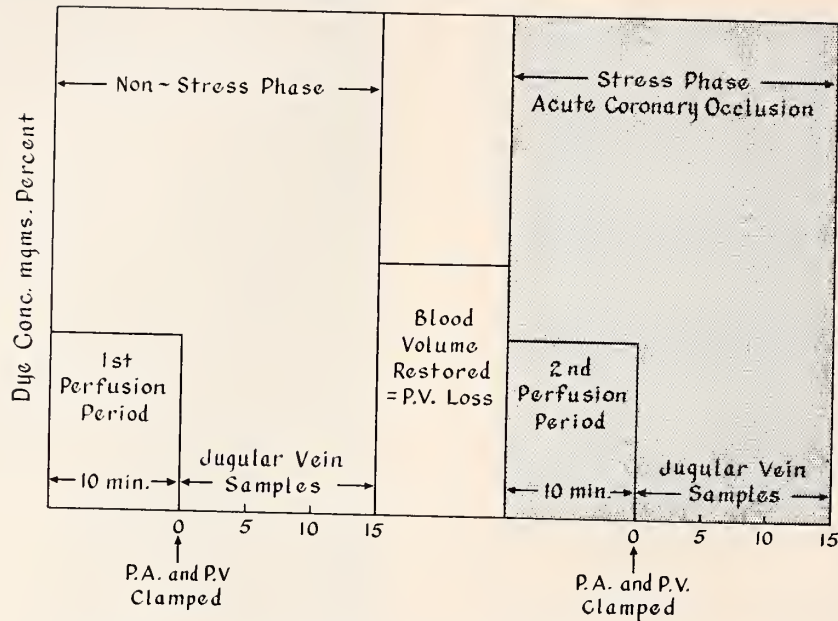


Fig. 7. Scheme of sequences in directional flow study. In the first perfusion period, nonstress phase, 100 to 125 cc. of citrated whole blood containing 5 cc. of Evan's blue dye is dripped into the pulmonary artery of the grafted lung over a 10-minute period. The pulmonary artery and pulmonary vein are then cross-clamped in order. Jugular vein samples at five-, ten- and fifteen-minute intervals are drawn. The animal's blood volume is restored. The second perfusion period, stress phase with acute coronary occlusion, is conducted as in the first phase and jugular vein samples are repeated.

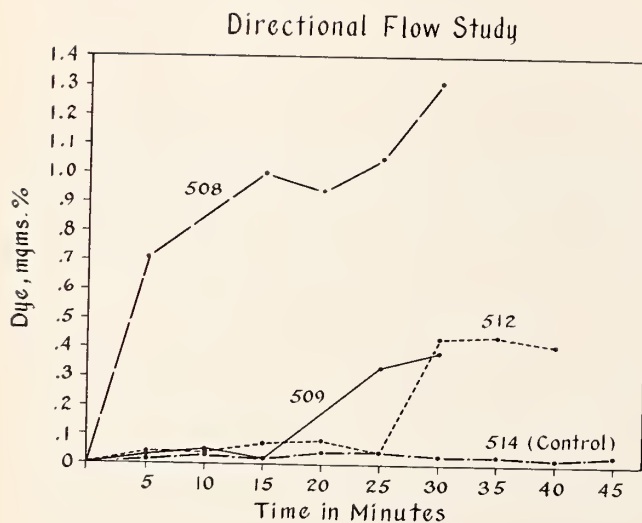


Fig. 8a.

Figure 8 (a). Following perfusions, blood samples from jugular veins are centrifuged and dye content concentrations of plasma are read from a spectrophotometer. Graph above shows results of four consecutive directional flow studies. Number 508 shows an appreciable amount of dye in the first phase, but nevertheless, an increase in the second phase. The cause for dye in the first phase was not determined. Possibilities are technical error with reflux of dye into systemic circulation and dependency on extracoronary source of blood without coronary occlusion. Studies 509 and 512 show

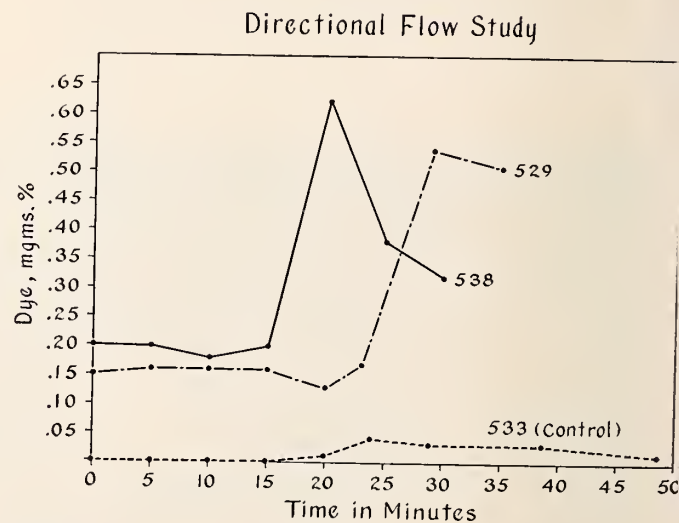


Fig. 8b.

essentially no dye from systemic blood samples taken in the first, nonstress, phase, whereas, in the second phase with acute coronary artery occlusion there is a significant rise in dye concentration. Number 514, a control study without cardiopneumopexy, shows negligible amounts of dye following both phases of perfusion. (b) Dye concentrations of systemic blood samples following perfusion studies. Numbers 529 and 538 show small concentrations of dye during the first phase of perfusion with a significant sharp increase when acute coronary occlusion is present. Number 533, a control study, shows essentially no dye in both phases.

cleavage (Figs. 6 and 7). On the basis of dye studies of systemic blood samples following perfusion of the grafted lobe (Figs. 8a, b), it appears that blood from an extracoronary source, grafted lung in our studies, flows into the normal coronary circulation in small increments and is significantly increased when acute coronary occlusion is induced. The data support the feasibility of augmenting the coronary circulation by an extracoronary blood supply. Details of the surgical technique of this modification of cardiopneumopexy with pulmonary segmental resection, injection studies and directional flow studies have been described previously.¹⁹

Subsequent mortality-infarct studies have shown that modified heart-lung graft provides significant protection against coronary artery ligation. The details of these experiments and the follow-up studies of surgically treated patients will be the subject of a later report.

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PROFESSIONAL LIABILITY SUBJECT OF NEW FILM

The second film in the AMA-American Bar Association series on "Medicine and the Law" will deal with prevention of professional liability action, it has been announced. Titled "The Doctor Defendant," the film will be available from the AMA Film Library for medical society or association showings, beginning July 1.

The new film dramatically presents four case reports of situations which caused legal action against physicians. In reviewing these alleged mal practice cases, the thirty-minute black and white sound film also demonstrates how a professional liability committee functions. It will be premiered at the AMA convention in New York City on June 5.

"The Doctor Defendant" is a companion film to "The Medical Witness" in the series produced by The Wm. S. Merrell Company, Cincinnati, O., ethical phar-

maceutical laboratories, in cooperation with the AMA and the ABA, as a service to the medical and legal professions.

"The Medical Witness" depicts right and wrong methods of presenting medical testimony by re-enacting a personal injury trial. It was named by *The New York Times* as one of the best 16 mm. films produced in 1956. A thirty-minute black and white sound film, it was also selected by the Golden Reel Film Festival as one of the five best films on professional education.

Societies desiring to show either or both films may write to the Film Library, American Medical Association, 535 No. Dearborn Street, Chicago 10, Illinois, or to Dr. John B. Chewning, director of professional relations, The Wm. S. Merrell Company, Cincinnati 15, Ohio.

Benign Tumors of Peripheral Nerves and Their Masquerade

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THE OCCURRENCE of tumors of peripheral nerves is infrequent enough in the lifetime of the individual physician to limit his practical knowledge and experience. Despite the considerable amount of attention and interest devoted to these tumors, the pertinent literature has concerned itself mainly with origin and pathologic classification; thus, the casual reader with little neurosurgical or neuropathologic interest may have undergone only slight exposure to the clinical manifestation of these tumors.

General Background

Although much has been written about tumors of peripheral nerves, final incontrovertible proof of their cause has yet to be demonstrated. Therefore, we have chosen to refer to these tumors as "neurofibromas," or "neurilemmomas." The term "neurofibroma" is a time-honored, generally understood label. "Neurilemmoma" appears to be the least objectionable of the remaining alternate terms, such as schwannoma, perineural fibroblastoma, neurinoma, peripheral glioma, neuroma and schwannoglioma, for it does not connote embryonic derivation of tissue.

Since the literature on tumors of peripheral nerves is concerned primarily with the rather technical aspects of etiology and cellular derivation, only some of the more prominent contributions will be mentioned. Tumors of peripheral nerves were referred to by the ancients as "nodes" or "ganglions." Cheselden¹ stated that a neural tumor had been removed in 1773. However, Odier² generally is credited with priority (1803) in this subject. Smith,³ Virchow,⁴ von Reckling-

hausen,⁵ Verocay,⁶ Thompson⁷ and Antoni⁸ contributed importantly to knowledge of these lesions prior to 1920. Since 1920, the names of Masson,^{9,10} Foot,¹¹ Penfield,^{12,13} Bailey,¹⁴ Geschickter,¹⁵ Tarlov,¹⁶ Nageotte,¹⁷ Stout,¹⁸ Murray,¹⁹ Lhermitte²⁰ and Cohn,²¹ as well as other authors,²²⁻²⁴ have figured prominently in writings on tumors of peripheral nerves.

Present Study

We have studied a total of 343 solitary benign tumors of the sheaths of peripheral nerves that were removed surgically at the Mayo Clinic between 1909 and 1948, inclusive. All peripheral nerves were included in this study except the intracranial portions of the cranial nerves, the optic nerves, the spinal nerve roots and the sympathetic nervous system.

In an attempt to obtain a clearer picture of the true nature of these so-called benign tumors of nerve sheaths, we have excluded traumatic, amputational, sclerosing or diffuse plexiform neuro-
mas, metastatic, malignant or multiple tumors, and any lesions possibly related to Recklinghausen's disease.

The pathologic diagnosis was made routinely from fixed sections stained with hematoxylin and eosin. Special stains for reticulin, connective tissue, neurofibrils and fat were employed in some cases.

Report of Cases

During the course of this review of 343 benign tumors of peripheral nerves, we were impressed by the interesting masquerade with which these tumors occasionally may mimic other commonplace disorders. Reports of seven cases will be presented to illustrate this deceptive masquerade. Such lesions may be discovered if the possibility of these rather uncommon tumors is kept in mind.

One of the most interesting groups of tumors of peripheral nerves includes those lesions asso-

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ciated with pain in an extremity that simulate other clinical conditions; these tumors are found only by careful examination. Sciatic pain and pain in the lower part of the back usually are attributed to a lesion within the spinal canal such as a protruded intervertebral disk or intraspinal tumor, to constitutional disorders such as diabetes or gout, or to changes in the bony structure of the lumbosacral vertebrae, such as occur with osteoarthritis, trauma or strain. The following two cases illustrate how important it is to examine the peripheral nerves for evidence of tumor, even in patients with good "disk" stories.

Case 1.—A fifty-year-old man came to the clinic because of severe pain involving the entire right leg. He had slipped and fallen on a wet concrete slab, striking the right hip. Subsequently, he noticed soreness in the right ankle and lower leg; pain gradually ascended over the anterior and lateral aspects of the leg to the upper part of the thigh, the sciatic notch and into the hip. The pain was intermittent at first, simulating that of a disk syndrome. For three months previous to examination, the pain had been constant both day and night but worse at night, suggesting an intraspinal tumor. The muscles in the posterior part of the thigh and leg were tender.

Examination at the clinic disclosed weakness of the muscles of the entire right lower extremity without any sensory changes. A small nodule could be palpated in the middle third of the thigh in the region of the sciatic nerve. Pressure on this nodule produced excruciating pain both above and below the distribution of the sciatic nerve.

A midline incision was made on the posterior aspect of the middle third of the right thigh, and a neurofibroma measuring 2 cm. in diameter was found imbedded in the peroneal division of the right sciatic nerve. The tumor was carefully dissected free and removed. After operation, the patient was completely relieved of pain.

Case 2.—A forty-one-year-old woman came to the clinic because of pain in the lower part of the back and the left leg. This had been present for ten years, first occurring when she was six months' pregnant. Pain in the leg had been present intermittently for the next five years, when a dull ache appeared in the left popliteal space associated with a cramping sensation in the left leg. This type of pain continued intermittently for three years, after which she noticed intermittent sharp pain shooting from the dorsum of the left foot to the inside of the leg and extending into the back. Weakness of the muscles of the entire left leg was present, but sensory loss was not apparent. Some atrophy was evident. The patient had been diagnosed as having a protruded intervertebral disk but results of examination of the cerebrospinal fluid were negative.

Examination revealed a small nodule on the sciatic

nerve. A small neurofibroma measuring 18 by 15 by 12 mm. was removed surgically from the inner portion of the left thigh. The tumor appeared to be attached to the femoral nerve and to a branch of the anterior cutaneous or saphenous nerve. The patient was completely relieved of pain after this operation.

Another interesting example of the obscure masquerade that a peripheral-nerve tumor sometimes may effect is well demonstrated in Case 3.

Case 3.—A fifty-two-year-old man came to the clinic because of a two and one-half year history of pain and unusual sensations in the left leg. Pain in the medial aspect of the left thigh had commenced initially after the patient had bumped his left shin at a ball game. Two months later, he had experienced numbness of the medial aspect of the left knee and medial surface of the thigh. Six months later, the patient noted loss of strength in the left quadriceps muscle, which would cause him to fall on occasions. Severe paroxysms of pain lasting two or three hours began later in the medial aspect of the left knee, occurring most often at night. Narcotics were necessary to control the severe pain.

During the two-year period prior to registration at the clinic, the patient had various "septic foci" (teeth, tonsils, sinuses) removed or drained. He had tried applications of moist heat, physiotherapy and traction on the leg and had visited many warm-water spas with only transient relief. Absolute alcohol had been injected into the anterior crural nerves on the left. The cerebrospinal fluid had been considered to be normal. Exploratory lumbar laminectomy and rhizotomy had been done but to no avail.

Two months before consultation at the clinic, while hospitalized for pain, the patient had felt a mass in his left groin. Subsequent roentgen therapy had produced no effect on the pain.

Examination at the clinic revealed a firm, movable, tender tumor about 10 cm. in diameter in the left lower abdominal quadrant. The left thigh was smaller than the right and the left quadriceps muscle was paralyzed. Patellar and cremasteric reflexes were absent on the left.

Laparotomy revealed a neurofibroma measuring 20 by 12.5 cm. that was attached to the left femoral nerve. Removal of this tumor gave relief of symptoms.

A rather unusual cardiac masquerade occurred in Case 4.

Case 4.—A fifty-one-year-old man had been in excellent health until April, 1943. During a card game at that time, he noted a dull aching pain to the left of the sternum and a sharp shooting pain down the upper left arm. Shortness of breath was present for about an hour.

An electrocardiogram made several days later was considered normal. However, because of the patient's concern about a "heavy sensation" in the left precordium, he was advised to take a month's vacation. After the first few days of vacation, he again experienced dull aching pain in the left side of the thorax, and at times

he noticed a choking sensation in his throat. The precordial pain was induced by such factors as nervousness, fear, walking or fatigue. Two or three hours of work at his ordinary occupation caused the precordial distress to return and necessitated rest. The pain was relieved by rest and lying down and was better when he was not under nervous tension.

Careful examination at another clinic, which included thoracic roentgenograms that we reviewed later, suggested the diagnosis of mild coronary angiospasm. Rest, sedation and subsequent examinations were advised.

In January, 1944, because the patient was unable to lie on his left side, another thoracic roentgenogram was taken. A rounded mass was recognized at the right cardiophrenic angle and the patient was referred to the clinic.

Examination and stereoscopic thoracic roentgenograms at the clinic confirmed the presence of the mass. A benign neurofibroma measuring 9 cm. in diameter that had arisen between the ninth and tenth ribs was removed surgically from the posterior mediastinum on the right. The postoperative convalescence was uneventful and the patient was completely relieved of his symptoms. Evidence of cardiac disease could not be found.

Complaints of pain and disability involving the neck, shoulder and upper extremity are so common that the examining physician may overlook peripheral-nerve tumors as he considers the possibility of such entities as cervical hypertrophic arthritis, tumor of the cervical portion of the spinal cord, myelitis, protruded cervical intervertebral disk, posttraumatic brachial neuralgia, cervical rib, scalenus anticus syndrome, bursitis and angina pectoris.

Careful palpation of the involved parts may be exceedingly helpful, as shown in the following case, which typifies the problems present in many patients who have benign tumors of the cervical and brachial plexus.

Case 5.—A sixty-six-year-old man who had severe essential hypertension was first examined at the clinic in March, 1933, because of a two and one-half year history of pain in the left arm. Initially, the patient had begun to notice occasional sharp shooting pains in his left arm and a sore neck. He had not sustained any injury to his neck. These pains often were accompanied by a feeling of tingling and numbness in the fingers. After the patient used his left arm for a few minutes, he would note the onset of a dull ache, which was most severe in the region of the elbow. During this period, the patient had several episodes of epistaxis apparently related to the hypertension.

The sharp shooting pains, dull ache and tingling paresthesia were all accentuated when the patient lay down. When standing erect, he obtained considerable relief from the discomfort. Coughing, sneezing and straining greatly increased the pain, as would flexion and

extension of the neck and turning the head. Precordial distress had not been present.

Various forms of treatment had been tried but only intermittent relief had been obtained. The pain and discomfort had become gradually worse during the year before registration at the clinic. Multiple examinations had been unrewarding as to the cause of the pain. His ability to earn a living was becoming seriously affected and he had become rather concerned.

Just before the patient came to the clinic, the home physician had noticed a small lump in the left side of the neck. Roentgen therapy to this region had not produced any effect on the symptoms.

Examination at the clinic confirmed the presence of a nodule in the left supraclavicular fossa. A benign neurofibroma was removed surgically from one of the branches of the left brachial plexus. Recovery was uneventful and the patient obtained complete relief from his distressing symptoms.

Another intriguing masquerade was that of "renal colic" in Case 6.

Case 6.—A twenty-two-year-old woman was first examined at the clinic in April, 1945, because of a three-year history of pain in the left flank extending to the left thigh. The patient had bumped into the corner of a table, striking her abdomen. Several months later, she had noted the onset of pain in her left flank. This pain extended down the anteromedial aspect of the left thigh; it was severe and paroxysmal, occurring once or twice a month and being helped sometimes by complete rest in bed. More often than not, however, morphine was required for relief.

One month prior to admission, the patient had been bedridden for twenty-two days as the result of severe pain and tenderness in the left flank, extending to the anteromedial aspect of the left thigh. Straining and coughing accentuated the distress, as did even the slightest motion in bed; morphine was required. Pain was absent at night. The patient had noted blood in her stools previously and had been treated for amebiasis. A mild vaginal discharge had been present; the menses were normal and there was no evidence of urinary dysfunction.

A diagnosis of kidney stone, "floating kidney" or renal tumor had been made elsewhere. Just prior to the patient's admission to the clinic, the suggestion that a tumor of the spinal cord might be the basis of her trouble prompted the patient to seek outside opinions.

Examination at the clinic revealed slight diminution of sensation over the first and second lumbar dermatomes. Examination of cerebrospinal fluid showed no abnormalities. Excretory and retrograde urograms and roentgenograms of the abdomen and pelvis indicated normal conditions in the upper part of the urinary system. A round shadow of increased density appeared over the psoas muscle in the left lower quadrant.

A benign neurofibroma measuring 6 by 5 by 6 cm. was removed surgically from the extraperitoneal paravertebral space on the left; the tumor apparently arose

from a branch of the left lumbar plexus. The postoperative convalescence was uneventful. A minimal postoperative neurologic deficit remained. The distressing symptoms were completely relieved.

Case 7.—A fifty-nine-year-old man was referred to the clinic for evaluation of Bell's palsy on the left side of his face. Six months previously, the patient had been driving his car with the window open and the wind blowing on his face. He felt later as though he had "caught cold" in his face. His face felt "heavy" the next morning and he noted that speech was difficult. Looking in the mirror he recognized that his face was completely paralyzed on the left side.

A diagnosis of typical Bell's palsy was made and he was told that treatment was not necessary except perhaps to massage the face and to attempt voluntary innervation of the left facial musculature. After six months had passed with no signs of return of function, the patient was referred to the clinic.

Our examination showed complete palsy of the peripheral portion of the left facial nerve. No history of headache, visual disturbance, pain, diminished facial sensation, tinnitus, reduced audition, dizziness or staggering gait could be elicited. The optic rotations were normal. Fundusoscopic examination disclosed normal optic nerves. Careful palpation along the peripheral course of the left facial nerve revealed a small, moderately firm nodule just distal to the emergence of the nerve from the stylomastoid foramen.

A small benign neurofibroma was enucleated surgically from the facial nerve.

A number of patients dated the onset of their trouble to some traumatic incident. It is difficult to know whether the accident merely helps to fix the time of events in their life or whether trauma in certain cases may precipitate symptoms as the result of edema or hemorrhage in the unsuspected tumor. Trauma itself, however, would not appear to play an important role in the causation of these tumors.

Symptoms

The shortest duration of symptoms recorded in our 343 cases was several days and the longest span was thirty-eight years. Neurofibromas (neurilemmomas) of general distribution had an average duration of symptoms of 4.7 years. Tumors arising in the thoracic cavity had an average duration of symptoms of 3+ years; however, the majority (twenty-nine cases) of the thoracic tumors were asymptomatic and were discovered accidentally during routine roentgenography of the thorax.

Females predominated slightly over males, 183 to 160. The youngest patient was a three and one-half-year-old girl who had an asymptomatic

tumor of the thorax. The oldest patient was an eighty-one-year-old man with a tumor of the ulnar nerve whose complaints were of only several months' duration.

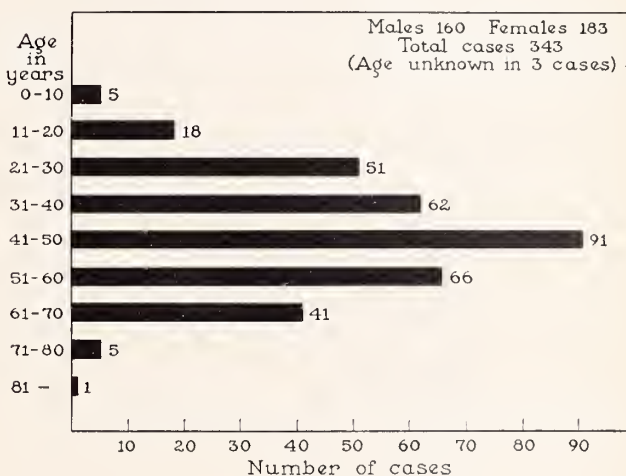


Fig. 1. Age distribution of patients with benign peripheral-nerve tumors.

More than half (219 cases) of the lesions occurred in the age groups between thirty-one and sixty years. The greatest number of tumors (ninety-one cases) occurred in the age group between forty-one and fifty years. At the extremes of age, five patients were in the first decade of life and six patients were more than seventy years of age (Fig. 1).

The commonest symptoms or complaints in order of frequency in our series were a lump (tumor, nodule or mass), pain and paresthesia. Pain, although frequent, was not a particularly outstanding complaint. Tumors occurring near vital structures in cramped quarters, such as the neck, gave symptoms due to impingement of the mass on neighboring anatomic structures. Lesions in the thorax and abdomen often were symptomatically silent. Other symptoms are summarized in the accompanying table.

That the symptoms caused by these tumors are well explained by the slow expansion of a soft mass already has been adequately described in the literature. Little emphasis has been placed on the rather startling symptoms that may be caused by the growth of this exceedingly benign tumor in restricted quarters (head and neck), as mentioned previously.

The minimal symptoms produced by relatively enormous intrathoracic neurofibromas (neurilemmomas) emphasize the importance of routine

TABLE I. FINDINGS IN 343 CASES OF BENIGN
TUMORS OF PERIPHERAL NERVES

Mass	224
Pain	
Spontaneous	64
Pressure	56
Numbness or paresthesia	17
Motor weakness	15
Facial palsy	2
Ache	9
Displacement of eye	7
Sensory loss	
(objective)	4
Difficulty in swallowing	4
Failing vision	4
Hoarseness	3
Sore throat	2
Cough	2
Miscellaneous	
Nasal congestion	
Ptosis	
Nasal hemorrhage	
Pain on swallowing	
Nasal obstruction	
"Dragging sensation"	
"Drawing sensation"	
Rectal bleeding	
Horner's syndrome	

fashion, slowly growing and exhibiting few objective motor or sensory symptoms, the diagnosis of a benign tumor of a peripheral-nerve sheath should be strongly suggested. Likewise the presence of a large, silent, rounded mass found roentgenologically in the posterior part of the mediastinum should bring to mind the common occurrence of benign neurofibromas in this part of the body.

A slowly or rapidly growing tumor of a nerve causing undue pain and discomfort and showing early motor and sensory disturbances may not be a benign neurofibroma (neurilemmoma). This is particularly true if the patient shows evidence of Recklinghausen's disease; the literature records an 8 to 15 per cent incidence of sarcomatous degeneration in such tumors.²⁵

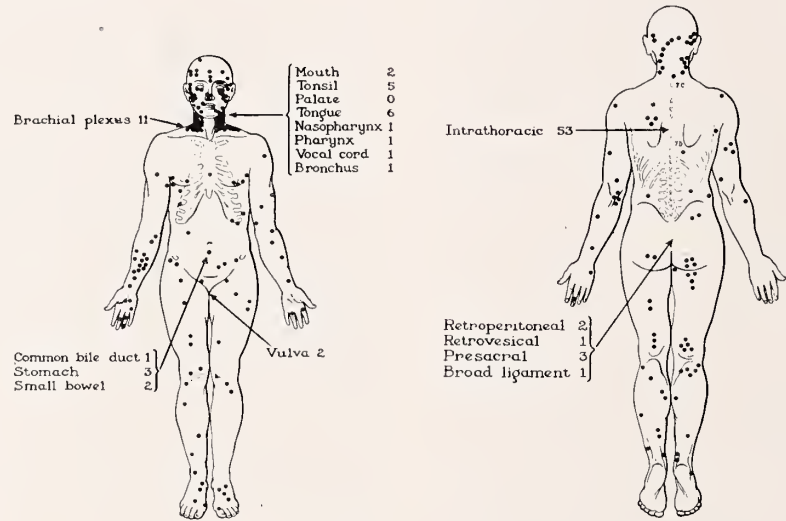


Fig. 2. Anatomic distribution of 343 benign peripheral-nerve tumors.

roentgenograms of the thorax and underline the important service being performed by mass survey units in the United States.

The paucity of sensorimotor defects in our series, even when a large tumor involved a specific nerve trunk, is rather characteristic and has been well documented previously.

It may be difficult to diagnose those tumors located deeply or in silent zones. Subcutaneous tumors not associated with nerve trunks (and in the absence of Recklinghausen's disease) also are more difficult to diagnose correctly. However, when one discovers along the course of a nerve a lump that is soft, occasionally transilluminable, freely movable laterally but not in a longitudinal

Pathology

Microscopic studies proved that the tumors were neurofibromas. Some of them presented the picture of cells arranged in parallel fashion, the nuclei of which, standing adjacently, formed nuclear palisades. These cells resembled Schwann's cells. Other tumors were made up of more collagenous or loose myxoid tissue with little tendency toward nuclear palisading. Their appearance was more like that of connective tissue. So many gradations occurred between these two types that the extreme difficulty in determining the etiologic factors by histologic methods is apparent. Less and less attention has been paid recently to the Antoni type A and B tissue described so commonly in the literature.⁸

The gross appearance of these tumors is well known. Neurofibromas may be encountered in all parts of the body; in our series, the tumors oc-

removal if feasible. Those lesions subjected to roentgen therapy prior to surgical excision showed little effect from the irradiation.

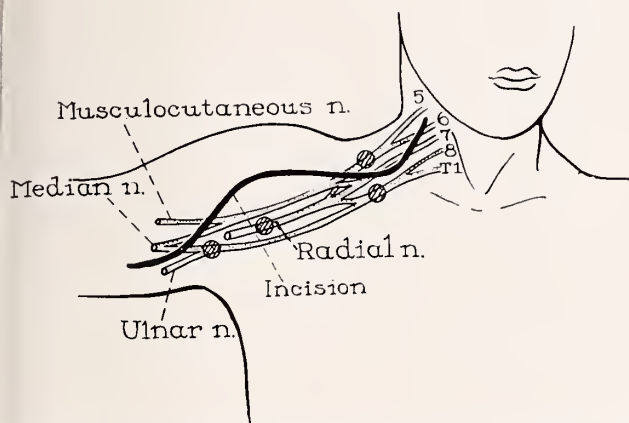


Fig. 3. Surgical approach to benign tumors located on various portions of the brachial plexus.

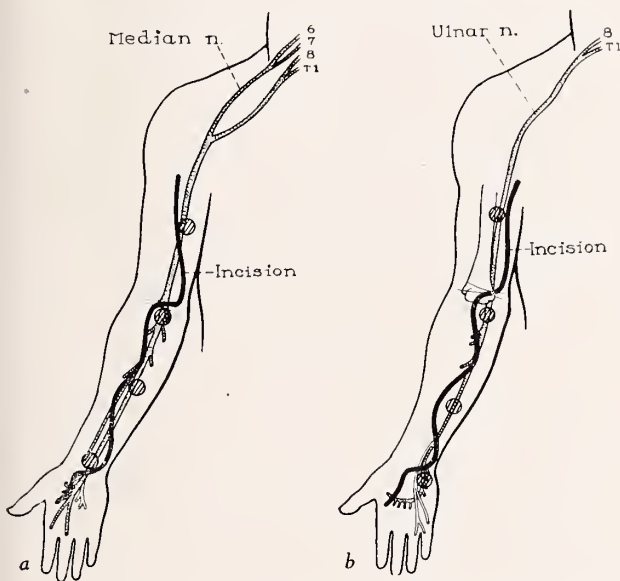


Fig. 5. Operative incisions for the approach to benign tumors of nerves of the upper extremity. *a.* Median nerve. *b.* Ulnar nerve.

curred most frequently on the head and neck, on the lower extremities and in the thorax (Fig. 2).

Treatment

Treatment of benign tumors of peripheral-nerve sheaths is entirely surgical. Such tumors, particularly those occurring near vital structures, should be totally excised; however, enucleation may suffice if the lesions occur in important motor nerve trunks. Surgical excision alone has been adequate for recurrent neurofibromas (neurilemmomas) in this series. In the presence of Recklinghausen's disease, careful attention should be paid to total

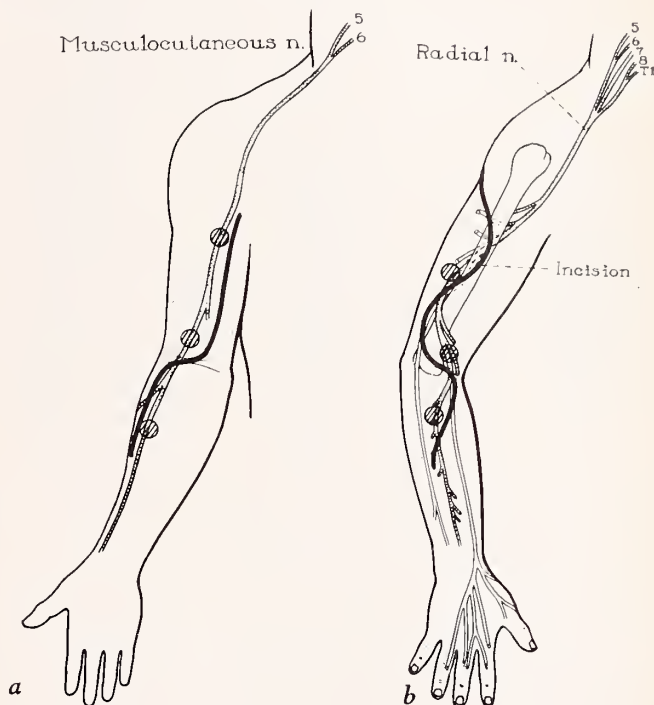


Fig. 4. Operative incisions for the approach to benign tumors of nerves of the upper extremity. *a.* Musculocutaneous nerve. *b.* Radial nerve.

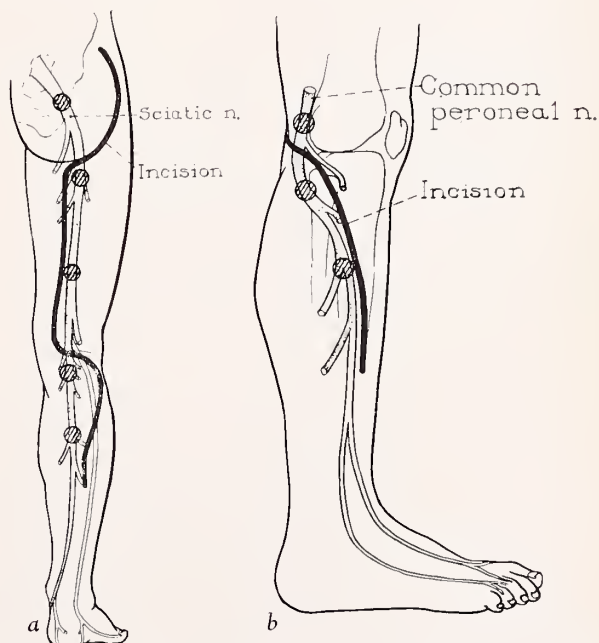


Fig. 6. Operative incisions for the approach to benign tumors of nerves of the lower extremity. *a.* Sciatic nerve. *b.* Common peroneal nerve.

Tumors of nerves located in the head and neck or in the thorax or abdomen are approached through standard surgical incisions employed in

routine operative procedures in these respective regions.

Based on experience during World War II with injuries to major peripheral nerves and on sug-

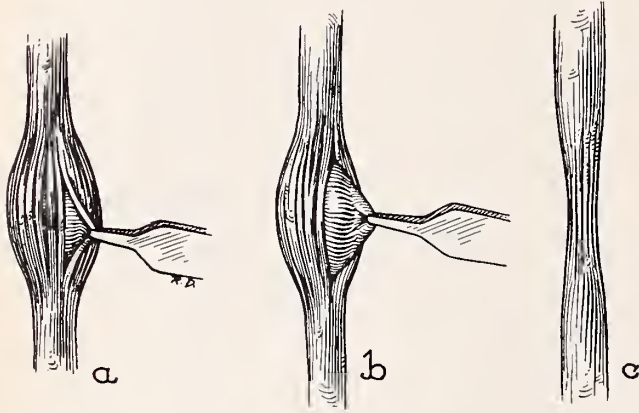


Fig. 7. Enucleation of a benign tumor from between the fibers of a major nerve trunk.

gestions from our plastic surgical colleagues, it has been our practice to approach benign tumors of the brachial plexus and of major nerves of the upper and lower extremities by means of the incisions and modifications of the incisions pictured in Figures 3 through 6. Postoperative discomfort because of scars and deformity or limitation of motion in extremities may be considerably lessened by use of such incisions. In addition, attention paid to lines of major cutaneous stress (Langer's lines) accelerates healing of the wounds and promotes a smoother convalescence.

In dealing with a tumor of a major nerve trunk, surgical exigency may force the surgeon to choose between enucleation (if feasible) and excision with primary end-to-end anastomosis of the cut ends of the nerve (Fig. 7). Tumors of sensory nerves do not present the surgical problems encountered in tumorous involvement of a major motor nerve. Many of these benign tumors fortunately may be enucleated rather satisfactorily. If possible, complete removal of the capsule of the tumor is a prerequisite. It is unfortunate to produce an extensive motor deficit during removal of a benign lesion and this should be avoided if possible.

If excision and end-to-end anastomosis are advisable, strict aseptic technique must be employed. Adequate mobilization of the proximal and distal segments of the nerve is a necessity; however, the longitudinal and lateral blood supply to the nerve

trunk should be paramount at all times in the surgeon's consideration.²⁶

It is our practice after excision of the tumor to excise cleanly the cut ends of the nerve with a sharp scalpel or razor blade and to repair the nerve with 00000 interrupted black arterial silk sutures. Advantage may be taken of length gained through mobilization and transplantation and by means of flexion of joints to compensate for neural defect after excision of a tumor. Considerable care should be exercised in the attempt to approximate major bundles within the nerve during anastomosis. The line of sutures in the nerve is not wrapped or covered. After approximation of the adjacent tissues, the wound is closed by means of plain catgut or silk sutures in the subcutaneous tissues and interrupted black silk sutures in the skin.

An involved joint may be immobilized through the use of a sling, posterior molded splint or plaster cast for several weeks after operation. Early graded physiotherapy is instituted, usually in the latter part of the first week after operation. Antibiotics are routinely employed prophylactically beginning the evening prior to operation; their use is maintained until the cutaneous sutures are removed.

Recurrence

The longest postoperative follow-up of a patient was thirty-five years. A total of fourteen patients were treated subsequently for local recurrence of the tumors. Several had recurrence on multiple occasions; the maximal number of episodes of recurrence before cure was attained was three. The recurrence rate is not known for those patients who were not seen again subsequently. Two patients are known to have died from sarcoma developing at the site of previous incision; one other may have had sarcoma.

Summary and Conclusions

Solitary peripheral neurofibromas (neurilemmomas), in the absence of the stigmas of Recklinghausen's disease, apparently are extremely benign lesions that may masquerade deceptively as other pathologic conditions.

These tumors most commonly are evidenced by the presence of a mass along the course of a nerve, but if they occur in deeper tissues or in the thorax or abdomen they may be "silent" and an accurate diagnosis may be delayed or difficult.

Treatment of neurofibromas is always surgical and removal can be effected through excision or capsular enucleation. Recurrence is uncommon, as is malignant sarcomatous degeneration. Roentgen therapy does not appear to be effectual, and trauma apparently is unrelated to the occurrence of these tumors. Advantage should be taken of Langer's cutaneous lines and of "step" incisions crossing flexion creases in planning the operative approach. The prognosis should be excellent after adequate enucleation or total excision.

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PROFESSIONAL NURSING SCHOOL ADMISSIONS DECLINE

The number of new students entering schools of professional nursing dropped last year, while admissions to schools of practical nursing remained steady, according to announcement by John H. Hayes, chairman, Committee on Careers, National League for Nursing.

Schools of professional nursing in the United States and territories last year enrolled 45,839 new students, as against 46,498 the previous year. This was the first year since 1952 that admissions to these schools declined and thus failed to keep pace with the steady growth of the college age population.

Practical nursing programs, which are usually one-year nursing courses offered by hospitals, community agencies and vocational schools, admitted some 15,500 new students in the academic year, 1955-56, a number

close to the previous year's admissions.

Students graduated last year from schools of professional nursing totaled 29,591; practical nursing programs prepared about 10,500.

Mr. Hayes advised nursing schools and state and local groups concerned with recruiting students for a nursing career to study their own admission policies, educational programs, scholarship aids and other factors influencing students in choosing a nursing career.

The college or university programs offering a baccalaureate degree, which are four-year to five-year college programs with a major in nursing, admitted 7,145 new students, compared with 6,985 in 1955, indicating a continuation of the growing interest in college and university education for a nursing career.

Sensitization to Blood Antigens in Rh Positive Patients

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NUMEROUS cases of sensitization to the less commonly known hereditary blood antigens have been investigated at the laboratories of the Minneapolis War Memorial Blood Bank. These cases are of particular interest because the sensitizations occurred in Rh₀ (D) positive persons in whom physicians usually do not expect sensitization.⁸

The following six cases will illustrate typical problems involving antibodies other than anti-Rh₀ (anti-D).

Case 1.—Sensitization of Rh Positive Rh₁ (CDe) Patient with Production of Anti-rh" (anti-E)¹¹.

Clinical Data.—C. J., aged thirty, a Puerto Rican, the mother of three living children, was group O, Rh positive. She was unable to give a clear history, as she did not speak English. On March 16, 1955, during her first trimester of pregnancy, she was hospitalized for surgical repair of bilateral dislocation of the hips. One 500-cc. unit of blood was administered. On May 11, she received 3 units of O, Rh₀(D) positive blood with no reaction. On May 18, 250 cc. of O, Rh positive blood was given (blood No. 394). The patient reacted with chills and fever. On May 27, 100 cc. of O, Rh positive blood was given (blood No. 433); this was also followed by a reaction. On May 28, 100 cc. of O, Rh positive blood (blood No. 435) was given followed by a hemolytic reaction. On July 8, a sample of the patient's blood was referred to the War Memorial Blood Bank for study. On October 19, 1955, the patient was delivered of an erythroblastotic female infant.

Laboratory Findings:

May 18—Post-transfusion bilirubin 1 min. 1.0 mg. per 100 cc.
Total 2.7 mg. per 100 cc.
Post-transfusion plasma hemoglobin 81.0 mg. per 100 cc.
May 28—Post-transfusion plasma hemoglobin 166.0 mg. per 100 cc.

Serological Findings:

Blood group of patient:
O, Rh positive: Genotype R₁R₂ (CDe/cde)
Blood group of donor No. 394:
O, Rh positive: Genotype R₁R₂ (CDe/cDE)

From the Minneapolis War Memorial Blood Bank.

Blood group of donor No. 433:

O, Rh positive: Genotype R₁R₂ (CDe/cDE)

Blood group of donor No. 435:

O, Rh positive: Genotype R₁R₂ (CDe/cDE)

The patient's serum contained an antibody against the rh" (E) antigen. The titer was 1:1 in saline, 1:8 in 20% albumin media, and 1:8 by the indirect anti-globulin (Coombs) test. The titer was repeated in September and found to be 1:8 in albumin and 1:16 by the indirect Coombs test.

Blood group of the husband:

O, Rh positive: Genotype R₂R₀ (cDE/cDe)

Blood group of twelve-year-old sib:

O, Rh positive: Genotype R₂R₂ (cDE/cde)

Blood group of eight-year-old sib:

O, Rh positive: Genotype R₀R₂ (cDe/cde)

Blood group of four-year-old sib:

O, Rh positive: Genotype R₁R₀ (CDe/cDe)

Blood group of infant:

O, Rh positive: Genotype R₂R₂ (cDE/cde)

Comments.—In this case, an Rh positive patient of the most common Rh type, Rh₁ (CDe), became sensitized by transfusion or by her first pregnancy or both to the rh" (E) antigen. This patient, even though positive to the Rh₀ (D) and rh' (C) factors, was negative to the rh" (E) factor and became sufficiently sensitized to it to cause severe transfusion reactions and to give birth to an erythroblastotic infant. It is a matter of actual observation that pure anti-rh" (anti-E) is usually produced in Rh positive persons of the genotype R₁R₁ (CDe/cde) or R₁R₁ (Cde/Cde). Persons negative to all three Rh factors who have been exposed to Rh positive blood containing the rh" (E) antigen may also produce anti-rh" (anti-E) but usually do so in combination with saline-agglutinating or incomplete anti-Rh₀ (anti-D).¹³

Case 2.—Sensitization of an Rh Positive Rh₁ (CDe) Patient with Production of Both Anti-rh" (Anti-E) and Anti-hr' (Antic-c)⁷

Clinical Data.—D. B., a white woman, aged 36, had six living children. Her last previous child, born in October, 1953, was jaundiced and spastic. During that pregnancy, that patient had toxemia that was followed by a postpartum nephropathy. In November, 1954, nephrectomy was performed. Two units of blood were administered at that time.

On December 27, 1955, she was referred to the transfusion service of the blood bank in the eighth month of her seventh pregnancy. Crossmatching revealed the presence of a specific anomalous antibody. One 500-cc. unit

of compatible blood (no. R 8174) was given without incident.

In the afternoon of December 27, 1955, after receiving the unit of compatible blood, she experienced false labor and was admitted to the hospital where she received another 400 cc. of group A, Rh positive blood (no. R 8054). The patient experienced chills and fever. There is no record of post-transfusion tests for serum bilirubin or urine hemoglobin. The patient's pretransfusion and post-transfusion blood specimens and the donor's blood causing the reaction were sent to the blood bank for serologic study.

On January 26, 1956, she was delivered of an erythroblastotic, group A, Rh positive male infant. That same day the infant was given an exchange transfusion of A, Rh positive blood, R_1R_1 (CDe/CDe). Rh negative, rr (cde/cde) blood was not selected because it contains hr' (c) to which the mother was sensitized. The infant made an uneventful recovery.

Serological Findings:

Blood group of patient:

A, Rh positive: Genotype R_1R_1 (CDe/CDe)

Blood group of donor No. R 8054:

A, Rh positive: Genotype R_2r (cDE/cde)

Blood group of husband:

A, Rh positive: Genotype R_2r (cDE/cde)

Following the reaction, the patient's serum strongly agglutinated the husband's cells and the cells of the reaction donor (R 8054). The serum contained anti-hr' (anti-c) and anti-rh'' (anti-E). The titer of anti-hr' (anti-c) was 1:1 in saline, 1:8 in 20% albumin and 1:16 by the indirect Coombs test. The anti-rh'' (anti-E) titer was 1:1 by the indirect Coombs test. A month later, immediately following the delivery of the infant, the titer to the hr' (c) was found to be 1:32 in saline, 1:128 in albumin, and 1:128 by the indirect Coombs test. The anti-rh'' (anti-E) titer was 1:1 in saline, 1:2 in albumin, and 1:2 by the indirect Coombs test.

Comments.—Case 2 illustrates dual sensitization in an Rh positive (CDe/CDe) patient. The sensitization was probably initiated by pregnancy and further stimulated by administration of blood. This patient, although Rh positive, became sensitized against two factors in the Rh-Hr system, namely rh'' (E) and hr' (c), both of which she lacked. These factors were present in the blood of the baby afflicted with erythroblastosis and in the blood that produced the hemolytic reaction. It is not rare for persons homozygous to the rh' (C) factor to produce anti-hr' (anti-c) and, if they also lack the rh'' (E) factor, they can produce anti-rh'' (anti-E) as well.¹²

Case 3.—Sensitization in an Rh Positive R_{H_1} (CDe) Patient with Production of Three Antibodies: Anti-rh'' (anti-E), Anti-hr' (Anti-c) and Anti-Kidd (Anti-Jk^a)¹

Clinical Data.—C. S., a white man, aged sixty, group A, Rh positive, was admitted to a Minneapolis hospital on May 17, 1955, for care of a gunshot wound. He was given 4 units of 500 cc. each of homologous blood within twelve hours. Crossmatching difficulties were absent and transfusion reactions were not reported. The patient gave no history of previous transfusions.

Ten days later, additional blood was ordered. Routine crossmatches at the hospital showed incompatibility and the patient's blood sample was sent to the blood bank for crossmatching and further study. Three different antibodies were found in this patient's blood.

Serological Findings:

Blood group of patient:

A, Rh positive: Genotype R_1R_1 (CDe/CDe),

$M,N,S,Le(a-), K-, Fy(a+), Jk(a-)$

The patient's serum contained anti-hr' (anti-c). The titer was 1:2 in saline, 1:16 in albumin and 1:32 by the indirect Coombs test. Anti-rh'' (anti-E) was present in low titer, demonstrable only by the indirect Coombs test in a titer of 1:1. The serum also contained anti-Kidd (anti-Jk^a), active in saline in a titer of 1:4 and in albumin media in a titer of 1:2.

Comments.—This case shows the ease with which certain susceptible persons can become sensitized to numerous antigens even with only one series of transfusions. Not all persons, of course, respond to antigenic stimuli with such alacrity. It is imperative that a record for future reference be kept of the antibodies identified in such a patient because they diminish in time and may not be demonstrable in later routine crossmatching procedures. However, they probably will reappear after the administration of blood containing the offending antigen. The antibody generally takes five to ten days to reappear; after it has done so, it will hemolyze the transfused cells and produce jaundice and a decrease in hemoglobin.

Case 4.—Sensitization of an Rh Positive Rh (CDe) Patient with Production of Three Antibodies: Anti-hr' (Anti-c), Anti-rh'' (Anti-E), and Anti-Duffy (Anti-Fy^a)²

Clinical Data.—L. S., a white man, aged thirty-nine, was group O, Rh positive. On December 8, 1955, the patient, a hemophiliac, was admitted to a Minneapolis hospital with a bleeding ulcer. On December 26, the decision was made to do a subtotal gastric resection.

The patient had been hospitalized many times and had received multiple transfusions of whole blood and plasma. He presented a history of transfusion reactions. Routine crossmatches at the hospital showed the presence of abnormal antibodies. His blood specimen was sent to the blood bank for crossmatching and further study. The three antibodies listed were demonstrated.

During the next six weeks, as large quantities of fresh frozen plasma and numerous units of compatible blood were given, the titer of the Duffy (Fy^a) antibody diminished in strength, possibly because of dilution, and was eventually demonstrable by the indirect Coombs test only. The anti-hr' (anti-c) remained strong.

Serological Findings:

Blood group of patient:

O, Rh positive: Genotype R_1R_1 (CDe/CDe),

$P-, K-, Fy(a-)$

The patient's serum contained anti-hr' (c) in a titer of 1:2 in saline, 1:32 in albumin and 1:64 by the indirect Coombs test. It also contained anti-Duffy (anti-Fy^a) in a titer of 1:2 in saline, 1:1 in albumin and 1:4 by the indirect Coombs test. Anti-rh'' (anti-E) was demonstrable in albumin in a titer of 1:1 and by the indirect Coombs test in a titer of 1:4.

Comments.—This case illustrates the problem of selecting blood for a patient who will require many transfusions over a long period or perhaps throughout life.

It is impractical during the earlier periods of such a regimen to select each blood for transfusion that does not possess some antigens the patient lacks. The development of one or more anomalous antibodies can be anticipated. These antibodies should be identified as they appear and thereafter care must be taken to avoid transfusing the specific antigen. Careful Coombs' crossmatching should be done when subsequent transfusions are given. Furthermore, as in case 3, a record should be kept of the antibodies identified in such a patient to avoid subsequent introduction of homologous antigens in transfusions.

Case 5.—Sensitization of an Rh Positive Rh₁ (CDe) Patient with Production of Anti-P^{5,6}

Clinical Data.—C. D., a white man, aged fifty-six, group B, Rh positive, was admitted on September 8, 1955, to a Minneapolis hospital for diagnostic studies. He gave no history of previous transfusions. He was given two units of blood on September 11 and two more on September 17. No crossmatching difficulties or transfusion reactions were reported. More blood was ordered on September 20. Routine crossmatches at this time with blood available at the hospital showed incompatibility and the patient's blood was sent to the blood bank for crossmatching and further study.

Serological Findings:

Blood group of patient:

B, Rh positive: Genotype R₁r (CDe/cde),
M,N,S,P—,Le(a—),Fy(a+b+),
K—, Jk(a+b+)

Patient's serum contained anti-P, active in saline and albumin in a titer of 1:4 at 37°C, 1:4 at 20°C and 1:16 at 4°C.

The two bloods given on September 17 were rechecked and found to be P negative and compatible with the patient's serum. A specimen from one of the donors whose blood was given on September 11 was found to be P positive. This was the possible sensitizing agent, although no reaction was noted. However, it was thought that this antibody was of the immune acquired variety because:

- 1—It was active at 37°C in albumin as well as in saline.
- 2—It was not detectable in the pretransfusion crossmatching tests at room temperature or 37°C.
- 3—After an interval of two weeks it was not demonstrable at 37°C, but a weakly active anti-P was detected at 4°C.

Comments.—P negative persons frequently have a naturally occurring anti-P agglutinin.³ This is not of clinical significance because it is a cold agglutinin, usually active at 4°C. The fact that this antibody did not interfere with the original crossmatch would seem to indicate that at that time it was either absent or too weak to be detected at 20° or 37°C. This case is unusual in that it appears that a naturally occurring low-titered anti-P may have been enhanced following an antigenic stimulus by a previous transfusion to be-

come an immune anti-P reacting at 37°C. These naturally occurring antibodies may become potentially dangerous in transfusions following stimulation in a P negative patient by previous transfusion or pregnancy.⁴

Case 6.—Sensitization of an Rh Positive Rh₁ (CDe) Patient with Production of Anti-Lewis (Anti-Le^a)^{9,10}

Clinical Data.—E. N., a white woman, aged fifty-five, mother of three children, was admitted to a Minneapolis hospital on October 16, 1953, for treatment of an osteomyelitis of the femur. She had previously received one unit of blood in May, 1952, and two units in July, 1953. No reactions were reported from these transfusions. On October 27, 1953, she received without incident six units of group O, Rh positive blood and on December 10 another unit of O, Rh positive blood. On January 13, 1954, a unit of group O, Rh positive blood was given. Soon after the transfusion was started, the patient complained of pain and a sensation of coldness in the arm. The intern decreased the rate of flow but, assuming that the distress was due to cold blood, permitted the transfusion to continue until a total of 200 cc. had been given, when it became obvious that a true transfusion reaction was occurring. The patient experienced back pain, her temperature rose to 103.6°F. and her pulse rate was increased to 110. Flushing, nausea and vomiting occurred. Six hours after the transfusion, the patient was free of symptoms. Urinary output remained good throughout the subsequent period.

The pretransfusion and post-transfusion blood specimens and a specimen of the donor blood causing the reaction were sent to the laboratory of the War Memorial Blood Bank for investigation.

Laboratory Findings:

January 12: Hemoglobin 10.1 gm. per 100 cc.

January 13: Post-transfusion plasma hemoglobin 490 mg. per 100 cc.

Post-transfusion urine hemoglobin 4 plus (port-wine color) (3 hours after transfusion)

Post-transfusion urine hemoglobin clear (6 hours after transfusion)

January 14: Serum bilirubin 0.73 mg. per 100 cc.

Serological Findings:

Blood group of patient:

O, Rh positive: Genotype R₁r (CDe/cde),
Ms, Ns, P+, Le (a—b—), Fy(a+), K—

Blood group of reaction donor:

O, Rh positive: Genotype R₁r (CDe/cde),
M, N, S, P+, Le(a+b—), Fy(a—), K+

The patient's serum both hemolyzed and agglutinated the donor's cells in saline and albumin crossmatches. Her serum was found to contain anti-Le^a in a titer of 1:8 in saline and albumin media at 25°C, 1:4 at 37°C and 1:4 at 4°C.

Comments.—Case 6 is one in which a Lewis negative (Le (a—b—)) patient experienced a hemolytic transfusion reaction due to Lewis antibodies, apparently stimulated by transfusions of Lewis positive (Le(a+b—)) blood. It does not follow, however, that Lewis antibodies invariably cause reactions. Like anti-P, they appear as naturally occurring antibodies, having low titers. If, however, they have been stimulated to a higher titer by

(Continued on Page 321)

A Survey of Resected and Non-Resected Pulmonary Nodules

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THERE has been considerable increased interest in the problem of isolated circumscribed pulmonary lesions with the advent of roentgenographic chest surveys, routine chest roentgenograms on admission to hospitals, pre-employment chest examinations, and advances in thoracic surgery, anesthesia, chemotherapy and antibiotics.

These lesions have been identified by a number of descriptive terms, some of the more common ones being "coin lesions," "isolated pulmonary nodules," "solitary intrapulmonary tumors," "solitary round lesions" and "solitary circumscribed lesions."

It is generally advocated that patients with this type of pulmonary lesion should have the benefit of a thorough history and physical examination. Other diagnostic examinations and tests that may be of positive or negative value are bronchoscopy, with aspiration, cell washings and cultures, sputum examinations, gastric washings and cultures, and skin tests for tuberculosis, histoplasmosis, coccidioidomycosis, echinococcosis and blastomycosis.

Roentgenographic examination of the chest is, of course, the sole means of discovering these nodules; it is also of value in localizing the lesion and in determining the presence of calcification. The question of small flecks or nodules of calcification is frequently equivocal. Calcific densities may lie anterior or posterior to the lesion and vessels seen on end or crossing obliquely may simulate the appearance of calcium. Oblique, lateral and Bucky films may be employed in the further evaluation of these cases. Planigrams are of great help in establishing the presence of calcium and also in proving cavitation. A more recent advantage in the use of planigraphy has been mentioned by Rigler and Heitzman,¹ who described "notching or umbilication" of a nodule that, when definite, is strong evidence of malignancy; however, its absence does not exclude malignancy.

Bronchograms may be of value but are of no aid in the diagnosis when, as frequently happens, these lesions are peripherally located.

Calcification is generally conceded as good evidence of the benign nature of a nodule. In a few rare instances, calcification has been described in circumscribed malignant nodules, and it is conceivable that a malignant tumor could engulf or envelop an area of calcification. Hodes² saw four patients who had calcified primary nodules that ultimately revealed bronchogenic carcinoma. Riemenschneider³ cited one calcified nodule that was pathologically proved to be a tuberculoma with a nodule of bronchogenic carcinoma in its wall. Tuttle⁴ mentioned one resected nodule in which a carcinoma had developed around a previous Ghon tubercle. London and Winter⁵ reported a papillary adenocarcinoma that contained calcium. Tuttle and associates⁶ reported that they have seen three cases of pulmonary carcinoma with x-ray evidence of calcification within the mass, but did not state whether or not these were circumscribed pulmonary nodules.

Nodules with concentric rings of calcification and homogeneously densely calcified nodules are invariably benign. Every effort should be made to locate previous roentgenograms of the chest, if any, as the previous presence or absence of the lesion may well influence the treatment.

Numerous articles have been published, particularly in the past ten years, in regard to the medical, surgical and pathologic aspects of these lesions, along with statistics concerning their malignancy or benignancy. Some authors have established certain criteria for the selection of pulmonary nodules, such as size, usually limited to 4, 5 or 6 cm. in diameter, excluding hilar nodules, calcified nodules, lesions with cavitation, lesions associated with a history of previous malignant disease and those not completely surrounded by pulmonary parenchyma, and lesions with a proved history of pulmonary tuberculosis or with roent-

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PULMONARY NODULES—BAGGENSTOSS

TABLE I. REPORTED DATA ON RESECTED PULMONARY NODULES

Authors	Total Cases	Malig., Total		Bronch. Ca.		Bron. Aden.	Metast.	Other Malig.	Benign, Total		Inflam.	Ben. Tumor
		No.	%	No.	%				No.	%		
Efler & associates ^{7*}	24	4	16	1	—	—	1	2	20	84	9	11
O'Brien & associates ⁸	21	9	43	8	38	—	—	1	12	57	10	2
Sharp & Kinsella ⁹	55	15	27	11	20	—	3	1	40	73	22	18
Wolpaw ^{10**}	25	8	32	6	25	2	2	—	15	60	10	5
Grow & associates ^{11***}	86	21	24	—	—	—	1	—	65	76	61	4
Hood & associates ^{12†}	156	55	35	25	16	12	17	1	101	65	67	34
Davis & associates ^{13‡}	67	37	55	32	47	1	2	2	30	45	23	7
first 67 cases (1950)												
Davis & associates ^{13‡}	67	34	51	26	38	1	6	1	33	49	28	5
second 67 cases (1955)												
May & associates ^{14§}	36	12	33	8	22	—	4	—	24	67	18	6

*Younger age group; 10 patients 20 years of age or less; 6 patients 30 to 39 years of age.

**Bronchial adenomas not listed among the malignant lesions.

***Benign tumors include one diaphragmatic hernia.

†Bronchial adenomas¹² are included among the malignant lesions; calcified lesions are included; 32 lesions contained calcification (25 granulomas and 7 hamartomas); in each of the 17 metastatic lesions, it was known that malignant disease was present elsewhere in the body.

‡Bronchial adenomas included among malignant lesions.

§Found 60 cases among 40,000 films; in 24 cases, the nature of the lesion was not determined.

genographic evidence compatible with pulmonary tuberculosis. Other investigators have set no limitation as to size and include calcified lesions. Variations in statistics could be expected on this basis alone. The majority of published reports have been written by thoracic surgeons relating their personal experience or the experience of the institution with which they were associated. Many of these cases were referred and represented selected cases; these referred cases then undoubtedly underwent further selection by the surgeon. Resected lesions, therefore, although susceptible to definitive diagnosis, do not necessarily reflect the true incidence of malignant tumors among the solitary circumscribed nodules. Occasionally, in reports of resected lesions, mention was made of other pulmonary nodules but no hint was given as to their final outcome. Table I lists some statistics on resected pulmonary nodules.

Present Study

It appeared that it would be of interest to survey routinely discovered nodules, including not only resected lesions but, as far as possible, those that were not resected for various reasons. This study represents a survey of pulmonary nodules encountered at the Minneapolis Public Health Center from 1945 through 1954. Approximately 85,000 persons had roentgenograms of the chest at the Public Health Center during that period.

The criteria for the selection of cases were as follows: (1) Included were any fairly well-defined, single, round or ovoid intrapulmonary lesions. Lesions that appeared to touch a pleural surface were not excluded, as these may well grow out to the periphery of the lung and in the last analy-

sis offer the same problem as if a small amount of lung tissue was interposed between them and the pleura. (2) Nodules in the hilar region were excluded. (3) Cases were excluded if there was evidence of cavitation or calcification in the nodule on postero-anterior, lateral, oblique or Bucky roentgenograms. Cavitation is usually regarded as an indication for removal. (4) The lesions were not more than 4 cm. in diameter. (5) No cases were included in which a history of proved pulmonary tuberculosis or definite roentgenographic findings of tuberculosis or both were present. Cases in which a small calcified Ghon complex or small calcifications in the hilar regions or a fibroid deposit or two in the apices were present were not precluded, as such lesions are extremely common and I do not believe any surgeon would hesitate to operate because of their presence. (6) No cases in which known malignant disease was present elsewhere in the body were included, as this lends an entirely different aspect to the problem.

Records of 104 isolated nodules that fulfilled the above criteria were found in the period from 1945 through 1954. As was expected, difficulty was encountered in following these patients, as a number represent transients and many have a shifting address within the city, frequently not being co-operative regarding follow-up studies.

A total of twenty-four lesions were resected (Table II). Three of these lesions were carcinomas and one was a bronchial adenoma, giving an incidence of malignancy of 13 or 17 per cent, depending on whether or not bronchial adenomas are considered malignant.

Eighty lesions in this series were not resected

PULMONARY NODULES—BAGGENSTOSS

TABLE II. CLASSIFICATION OF TWENTY-FOUR RESECTED LESIONS

Malignant	Questionably Malignant	Benign 20	
		Tumor 2	Inflammatory 18
Carcinoma 3	Bronchial adenoma 1	Hamartoma 2	Tuberculoma 8
			Granuloma 6
			Histoplasmosis 2
			Organized infarct or unusual granuloma 1
			Coccidioidomycotic granuloma 1

TABLE IV. AGES OF 104 PATIENTS SURVEYED

Age, Years	Patients
20-29	11
30-39	14
40-49	29
50-59	23
60-69	20
70-79	5
80 or more	2
Total	104

(Table III). Of these cases, thirty-four were followed less than one year and ten from one to two years, producing a total of forty-four followed less than two years. This is too short a time to allow any assumption concerning their nature, except for one lesion that was observed from one to two years and proved to be metastasis from a renal carcinoma. Another case followed from one to two years finally was diagnosed as a bronchogenic carcinoma of the left lower lobe from roentgenographic and clinical studies. The nodule of interest in the present study was in the right upper lobe, and it is impossible at this time to determine whether or not any relationship existed between these two lesions. There was a probable slight increase in size of one lesion in the group followed from one to two years. However, this does not necessarily denote malignancy, as benign tumors and inflammatory masses may increase in size.

Thirty-six patients were observed for two or more years and twenty-three patients were followed for four or more years. If it is assumed that these twenty-three lesions were benign because of the four years or more of observation and if they are added to the resected nodules, the incidence of malignant lesions is approximately 6 or 9 per cent, depending on whether or not bronchial adenomas are considered malignant. It is, of course, rare for a malignant lesion of the lung to remain static for two or more years and rare indeed for one to remain static for four or

TABLE III. FOLLOW-UP IN EIGHTY NON-RESECTED LESIONS

Years	Follow-Up, Years								
	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8 or More
Patients	34	10	9	4	9	7	2	2	3

Followed less than 2 years—44.
Followed 2 or more years—36.
Followed 4 or more years—23.

TABLE V. TUMOR COMMITTEE RECOMMENDATIONS IN FOURTEEN RESECTED CASES

	Cases	Malignant	Benign
Recommended operation	12	2	10
Recommended further study	2	0	2

TUMOR COMMITTEE RECOMMENDATIONS IN SIXTY NON-RESECTED CASES

	Cases	Observed Less Than 2 Years	Observed More Than 2 Years
Indefinite, could be either	4	4	
Further study	8	6*	2
Recommended operation	19	11	8*
No operation	29	11	18

*One became slightly larger in size.

more years, particularly without the use of chemicals, hormones or radiation therapy. I have heard of one solitary circumscribed pulmonary nodule that was present for seven and one-half years and then a carcinoma was found at the site during operation.¹⁵ Whether this was a carcinoma from its inception or whether a carcinoma developed near a benign lesion is pure conjecture.

From Table IV it may be noted that the majority of these patients fall into the fifth, sixth and seventh decades of life, not a particularly young age group.

A review or recommendation by the Committee on Suspected Chest Abnormalities of the Hennepin County Medical Society was noted on seventy-four charts of this series. These are summarized in Table V.

It would appear that the percentage of malignant lesions in unselected circumscribed pulmonary nodules is appreciably lower than in a selected series of surgically treated lesions, of which many are doubly selected, first by the referring physician and then further by the thoracic surgeon. This selection is undoubtedly made on the basis of history, age of the patient, appearance and size of the lesion, availability of previous roentgenograms showing the presence or absence of the lesion,

demonstration of calcification within the nodule and the weighing of the positive or negative findings in skin tests, smears, cultures and other examinations. Such study and selection are of particular importance in the poor-risk patient, for whom the hazards of surgery must be seriously weighed against the implications of the lesion.

This report should not be interpreted as an attempt to minimize the seriousness of the problem of the pulmonary nodule or to encourage an attitude of watchful waiting. All of these patients deserve the advice and consultation of one thoroughly familiar with the problem.

Benign tumors, it is generally acknowledged, are best treated in many instances by resection and this is also true in some cases of inflammatory nodules. Benignancy of a certain number of pulmonary nodules can be well established without surgical intervention but in the majority of isolated pulmonary nodules the problem cannot be resolved except by resection, followed by microscopic examination of the specimen and cultures in some cases of inflammatory lesions.

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TESTS ON EFFECT OF TRANQUILIZERS ON HUMAN BEHAVIOR, DRIVING ABILITY

A battery of testing devices, designed to show how drugs like the tranquilizers affect normal human behavior and skills—such as those required for safe driving—was demonstrated at a meeting of the Michigan Clinical Institute held at the Sheraton-Cadillac in March. The tests were developed for use by the Mental Health Research Institute of the Department of Psychiatry, University of Michigan.

Dr. James G. Miller, Professor of Psychiatry at the University, who described the apparatus, said such devices have been used at the Mental Health Research Institute to determine what effect, if any, "Miltown," one of the tranquilizing drugs, has on the skills required for safe driving.

These studies, conducted by Dr. Miller and Drs. D. G. Marquis, E. L. Kelly, R. W. Gerard and Anatol Rapoport, showed that even when given in twice the ordinary single dosage, "Miltown" had no effect on driving ability, as measured by driving, steadiness and vision tests.

In the "Miltown" study, fifty normal subjects were given twice the regular dosage of the tranquilizer and, after the drug took effect, were asked to take a special driving test. The object of the test is to use ordinary

automobile controls to steer a model car which rests on a belt. Accuracy of steering at various speeds is measured, and the reaction time—the time it takes to hit the brakes when a red light appears—are also measured.

To eliminate any chance of misinterpretation in the "Miltown" study, each subject was given five different "drugs" over a five-day period and was tested each day for the effect of the particular drug on his behavior. The drugs included, in addition to "Miltown," a "dummy" drug, a "dummv" plus a shot of whiskey (one ounce of 86 proof), "Miltown" plus the whiskey, and "Dexedrine."

The tests also corroborated the well-known fact that alcohol "significantly worsened performance," Dr. Miller said. Subjects given alcohol plus "Miltown," however, were no worse than when given alcohol alone.

Pointing to the wide use of tranquilizers, and to the need for more information concerning their influence on the senses, Dr. Miller explained, "We hope with sensitive and precise tests of this sort to be able to get effective evaluation of behavioral toxicity of these drugs."

A Fatal Granulomatosis of Childhood

The Clinical Study of a New Syndrome

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IN 1950 a twelve-month-old-child was referred to the University of Minnesota Hospitals with a syndrome consisting of chronic, suppurative lymphadenitis, pulmonary infiltrations, hepatosplenomegaly and an eczematoid dermatitis about the eyes, nose and mouth. Since then we have seen three other children with an almost identical syndrome. We believe that this is a distinct entity not previously described in the medical literature. This syndrome, as we have observed it, follows a malignant course and at this time has been responsible for the death of three of our four patients. Of the many approaches we have taken in the management of these patients, none have proven successful and the disease has relentlessly progressed through severe debilitation to ultimate death of the patient.

Clinical Manifestations

Chronic, suppurative lymphadenitis was the presenting complaint in all of these children. Cervical lymphadenitis was present in all four patients, but involved the axillary area in two patients, the inguinal area in two patients and the epitrochlear area in another child. In three out of the four children this process started during the first year of life. One child developed his first symptoms at two years of age. Hepatomegaly was observed in all four children, while splenomegaly was present in three. Though the degree of splenic enlargement varied during the course of the disease, it did not seem to be correlated with the clinical severity at any particular

time. All of these children suffered an eczematoid dermatitis involving the eyelids and periorbital skin. The skin about the mouth and external nares was commonly involved in the same process. A serosanguinous nasal discharge was present at times. Over the face this dermatitis was associated with a chronic blepharoconjunctivitis that has been present in all of our patients. In one child the cornea became involved and resulted in considerable residual scarring. Three out of the four patients developed pulmonary infiltrations during the course of the disease. These infiltrations were present in a variety of pulmonary segments. At times clearing of this process was evident, but with continued observation these areas of consolidation recurred either in the same segment or in a previously uninvolved area. Pleural effusions were present in two of these patients.

It should be noted that during the first year of illness the chronic lymphadenitis was the most prominent clinical manifestation. This process seems gradually to abate while the pulmonary disease and general debilitation dominate the clinical picture during the latter stages of the disease. Death has occurred in three patients after an illness of two to three-and-a-half years. Our remaining child has had his disease for a little over one year.

All of our patients were boys. In one child there was a most provoking family history. In three previous generations on the maternal side of this boy's family, with the exception of the grandfather and great-grandfather, all the male members died during infancy with a syndrome described either as boils and septicemia or scrofula. The maternal grandfather had a similar process involving the left cervical area during infancy. He survived, however, though at this time, according to the patient's mother, he still has a mass present in the cervical area.

Fever was invariably present during the major

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portion of the disease. This did, however, vary greatly in severity. During the course of the disease there were periods of temporary improvement lasting up to several months. Marked growth failure became manifest shortly after the onset of the disease and continued throughout the remainder of the illness.

Laboratory Findings

No specific hematologic abnormalities were noted, though all of the patients exhibited varying degrees of anemia and polymorphonuclear leukocytosis. Brief intervals of eosinophilia were seen in two children and, in one, reached a peak of 20 per cent. There was no evidence of renal disease. Marked hypergammaglobulinemia was found in all four children. The gamma globulin levels ranged between 2 and 5 gm/100 ml., although there was considerable variation within this range in the individual patient. The degree of hypergammaglobulinemia was not correlated with the severity of the disease at any particular time. A striking elevation of the α -2 globulin was also seen on the electrophoretic pattern. No abnormalities of liver function were present except for an elevation of the zinc turbidity consistent with the known levels of gamma globulin.

Because of the striking resemblance to an infectious process, we have used every available means for the isolation of a pathogenic agent. Materials for cultural examination have included blood, urine, aspirated bone marrow, spinal fluid, pus from draining lymph nodes, aspirated material from suppurating lymph nodes, granulomatous nodes obtained by biopsy, and liver biopsy specimens in two patients. A granulomatous segment of lung was obtained from one of our patients. Appropriate media was used for isolation of a variety of pathogens, including the brucella species, *mycobacterium tuberculosis*, *pasteurella tularensis*, nocardia, *blastomyces dermatitidis*, and other pathogenic fungi. In two of the four patients lymph node homogenates were inoculated onto the cornea and into the anterior chamber of the eye in rabbits and intraperitoneally in mice, rabbits, and guinea pigs, and onto the chorio-allantoic membrane of the chick embryo. In addition, we have used a variety of tissue culture strains in an attempt to isolate a cytopathogenic agent. These tissue strains included one which was started from an explant of liver tissue obtained from one of our patients. In all of these

attempts we have failed to isolate an agent to which we could attribute the various manifestations of the disease. At times staphylococci have been demonstrated in suppurating lymph nodes. Because of the absence of staphylococci in the granulomatous nodes obtained at biopsy, we feel that this represents secondary infection of an open suppurating wound. Various serologic procedures were used in an attempt to demonstrate antibodies against brucella, *pasteurella tularensis*, and salmonella. Skin testing was performed with a variety of antigens including tuberculin, histoplasmin, blastomycin, coccidioidin and a cat scratch preparation. These tests were negative, with the exception of one child whose Mantoux apparently became positive in the course of his disease. Frei antigens injected intradermally in two patients gave negative results. Kveim antigen did not reveal any sensitivity in two of our patients.

Pathology

Gross examination of the areas of suppurative adenitis showed pockets of purulent material and a network of sinus tracts. Microscopic examination of involved lymph nodes revealed areas of central necrosis surrounded by mononuclear cell infiltration, together with multinucleated giant cells. There were striking numbers of both mature and immature plasma cells in these areas. Pulmonary granulomas of a similar nature were found in the biopsy material obtained at the time of an exploratory thoracotomy in one of our patients. Similar lesions were seen in two other patients on examination of postmortem material from their lungs. Liver biopsies obtained from two patients revealed the presence of multiple small granulomas of similar structure to those previously described. Bone marrow aspiration showed an increase in plasma cells. Postmortem examinations in the three children who have expired with this disease have failed to reveal further information as to the nature of the disease process. Extensive studies of biopsy material and postmortem material with Gram stain, acid fast, periodic acid Schiff and routine stains have not revealed evidence of an underlying etiologic agent. Two of these deaths were the result of staphylococcal empyema that developed in the last weeks of their illness and terminated with staphylococcal septicemia.

Attempted Therapy

Our management of these patients was largely empirical since the etiologic nature of the syndrome remains unexplained. We have attempted therapy with various antibiotics for long periods of time. Chloromycetin and erythromycin were used in high doses for periods of at least one month. Combinations of penicillin and sulfadiazine and the various tetracyclines have been used in all of our patients for periods of one to several months. Novobiocin has also been tried without effect. Two of our patients were treated for periods of six weeks to six months with PAS, streptomycin, and isoniazid. In none of the patients did any of these measures produce a demonstrable effect on the course of the disease. We have administered large amounts of gamma globulin to three of our patients. Alternating small blood and plasma transfusions were used for periods of six weeks in one of these children. Local x-irradiation was administered to the cervical area of two children. None of these therapeutic efforts appeared to alter the course of the disease process at any time.

Discussion

The picture presented by these children demands the consideration of an infectious agent as the prime plausible etiologic factor responsible for this disease. Clinically, these children have a syndrome indistinguishable from the descriptions of scrofula that appear in the older literature. We have made exhaustive attempts to isolate some agent which might be responsible for this disease. The only positive cultures that we have been able to obtain were those from areas which were potentially open to secondary infection. From these areas we have, on a number of occasions, cultured coagulase positive staphylococci. These were obtained from areas where there was a co-existent draining adenitis. We have, however, on an equal number of occasions, been unable to recover staphylococci from similar areas. It appears that in the development of the granulomatous adenitis there is an early phase in which these nodes are always sterile and a later phase in which the granulomatous area becomes necrotic, suppurates and may drain spontaneously. It is in this later phase that the staphylococci may gain entrance to these diseased tissues. The pathologic lesions of the lymph nodes in cat scratch disease are indis-

tinguishable from those seen in our patients.¹ However, neither the course of the disease nor the distribution of the lesions we have described can be considered to bear more than a superficial resemblance to cat scratch disease. Skin tests with potent cat scratch antigen were applied in three of our four patients and were negative. Further, none of these children had sustained cat scratch or cat bite prior to the development of his disease.

These investigations have led us to conclude that if there is some agent responsible for this disease it is such that it escapes detection by the currently available techniques. In the light of this vast array of negative information it seems to us more likely that this syndrome which we have described is more closely related to such conditions as Hodgkin's disease and the reticuloendotheliosis. It should be remembered that these diseases have been considered by many in the past to represent some bizarre response on the part of the host to an infectious agent.² The innumerable attempts to obtain direct proof for this assumption have been as fruitless as our own attempts with this new syndrome. On consideration of the clinical and pathologic aspects of those diseases that lie on the ill-defined borderline between infection and malignancy, there is evident a striking resemblance both with each other and with the new syndrome we have described in this paper. Such syndromes, however, may be distinguished from one another on the basis of their clinical and pathologic aspects. Such differences have provided the logical basis for considering them as separate disease entities although their basic etiologic nature remains obscure. Of the various granulomatous diseases that are distinct entities, sarcoidosis is probably the most difficult to separate conclusively from this new syndrome.³ The syndrome of sarcoidosis, as described in the adult, is one of a benign involvement of a variety of tissues in a granulomatous process. These lesions, when they occur in various groups of nodes, are generally firm and virtually never become necrotic or drain spontaneously through the skin as in tuberculous adenitis. A variety of osseous and cutaneous lesions have been described in association with sarcoidosis. No lesions of this character have been noted in the children described in this report. Neither were the pulmonary lesions that we have observed those of sarcoid. In spite of such great difference in the character of these two syndromes, and its extreme

rarity in childhood, it still remains a remote possibility that this malignant granulomatous disease is actually a childhood expression of sarcoidosis. There are two other syndromes of granulomatous disease that bear a somewhat closer resemblance. These are Wegener's⁴ granuloma and the midline granuloma⁵⁻¹¹ of the face. Wegener's granuloma is a generalized disorder in which there is a granulomatous destruction involving first some portion of either the upper or lower respiratory tract. At the periphery of these lesions there is always an arteritis indistinguishable from that seen in periarteritis nodosa. At some stage of this disease there is always evidence of renal involvement. Such characteristic lesions were not present in our patients. Midline granuloma of the face is a somewhat similar destructive process involving the mucosa of the upper respiratory tract, which progresses by direct extension to eventually destroy an extensive area over the face. The locally destructive nature and the limited area of involvement serve to distinguish this disorder from the syndrome that we have described. There are other disorders in which there is a granulomatous response on the part of the host. Certain irritants being introduced into various areas result in granuloma formation as has been shown for the so-called pyogenic granuloma and the pulmonary and cutaneous granuloma that have resulted from beryllium.¹² In these children no evidence was present to suggest exposure to such an agent nor was the distribution of the lesions of a similar nature. In 1954, Janeway and Craig¹³ described a group of five children with hypergammaglobulinemia, leukopenia, and increased susceptibility to staphylococcal and pseudomonas infections of the skin and respiratory tract. In none of these cases, however, were granuloma seen, and the two conditions, although superficially similar, must be considered to be separate entities.

Our studies of this disease have left us with the feeling that it may represent a generalized disorder of the reticuloendothelial system. If the various collagen diseases can be considered as peculiar sensitivity reactions, whose manifestations depend upon the particular tissues subject to this sensitivity reaction, then it is certainly plausible in this malignant granulomatous disease that we have described that the reticuloendothelial system might be the shock organ whose fundamental alteration

and eventual destruction results in the clinical picture presented.

Summary

1. Four male children suffering from a previously unreported syndrome consisting of chronic suppurative lymphadenitis, hepatosplenomegaly, pulmonary infiltrations and eczemoid dermatitis of characteristic distribution have been described. These manifestations are the result of a generalized granulomatous process and are associated with a striking hypergammaglobulinemia.

2. This new syndrome has been differentiated from recognized forms of infectious and noninfectious diseases producing granulomatous processes in childhood.

3. Extensive empirical efforts at treatment of the disease have been without effect upon the relentless progression that would seem to be a most characteristic feature of this syndrome.

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Carcinoma of the Rectum and Sigmoid Colon

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IT IS NOT the intention of this paper to cover the broad subject of carcinoma of the sigmoid and rectum completely but, rather, to attempt to stimulate our thinking on this disease and to re-evaluate the various methods of treatment which have been evolved for this particular malady.

In the past few years there has been a general trend toward extending the scope of operations and removing more and more tissue in the hope that a greater number of cures could be obtained. We have, I believe, arrived at a point now where, if we are going to extend further our operations for this particular affliction, we are probably going to have to do something of the magnitude of amputation at the waist. Operations which have been done by Brunschweig and his group eliminate from the pelvis all of the structures which can be sacrificed without sacrificing the bony pelvis and its associated structures. It will be interesting to see what the long term survivals are going to be on a procedure of this type. However, from the early published figures, it begins to look as though the survival rates will not be significantly higher than the survivals from the conventional type operations. In a recent report, Brunschweig et al quoted an operative mortality of approximately 20 per cent, which is about three or four times the accepted mortality for the conventional operations for cancer of this region. One wonders whether the greater salvage rate of such extensive surgery would be justified in view of this rather high surgical mortality rate.

In view of evidence that has been presented regarding the behavior of cancer both before and during operations, I believe that it is far more important for the practicing surgeon, who is called upon to treat carcinoma of the rectum and sigmoid, to pay greater attention to surgical technique in doing the surgery which is required to remove the lesion and the adjacent lymph nodes,

rather than to make an attempt to extend the operation and do what I think is still more or less an experimental procedure. Fisher and Turnbull at the Cleveland Clinic made a very excellent study of the spread of cancer by examining venous blood which is removed from the veins of the resected specimens, in carcinoma of the sigmoid and rectum, and found that in 32 per cent of cases there were carcinoma cells in the venous blood which had been trapped in the veins at the time of operation. This study was repeated by Adamson at the Lahey Clinic and the results were duplicated exactly. On the basis of this, it is certainly quite evident that extension of the operation to include another inch or inch and a half of lymph node tissue is going to do very little about the carcinoma cells which have been squeezed into the veins, have gotten into the portal circulation and perhaps are lodged in the liver at the time of the surgery. On the basis of this, ligating all of the blood supply before any manipulation of the tumor may conceivably help us to prevent some of the hematogenous metastases which have been the cause of death in by far the greatest percentage of our patients, and I am sure that this has been the experience of most of the people who are doing this type of surgery. Dukes published a very excellent review of the resected specimens at St. Mark's Hospital and found that 17 per cent of all resected tumors already had blood vessel invasion at the time of resection. The Lahey Clinic group in reviewing a series of 900 cases of carcinoma of the colon and rectum found that 28 per cent had blood vessel invasion at the time of resection. Grinnell published a series of cases which also revealed a 36 per cent incidence of blood vessel invasion in the resected specimen.

It should go without saying, in face of these figures, that even a minimal amount of manipulation of the tumor prior to ligation of the blood supply certainly will serve to enhance further spread of the disease which may have already spread at the time of the operation.

A word about isolation of the tumor within the lumen of the bowel by placing a tie around

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the bowel proximal and distal to the tumor, as advocated by Cole and his group. As a principle, I think this is an excellent one, inasmuch as manipulation of the tumor is certainly likely to break off either gross pieces of tumor or rub off cancer cells into the lumen of the bowel and cause a greater contamination of the anastomotic line. However, this procedure perhaps is of less importance than the very early ligation of the blood supply, inasmuch as this tumor has been shedding cells during its natural life prior to the time of surgery and there doesn't seem to be any good way of eliminating these cells from the lumen of the bowel by the use of any cauterizing agents or any other chemical means. It is, however, an added precaution that one should and can take without increasing the operative risk and may serve to prevent some recurrences or implants at the line of anastomosis. In our experience over the past five years we have not had occasion to see a patient who had a recurrence in the line of anastomosis. However, we still feel that the added safety factor of this rather simple procedure is well worth while.

The question, at what level should one do an abdominal-perineal resection and at what level should an anterior resection with end-to-end anastomosis be the procedure of choice, is one which at the present time is still open for discussion. As you all know, Bacon and his group at Temple University have been championing the abdominal-perineal pull-through operation for nearly all lesions other than those that are within the lower 5 or 6 cm. of the bowel. In conversations with this author it was my understanding that at the present time they are not doing this operation for any lesion below 12 cm. but are doing the abdominal-perineal resection with permanent colostomy. In the July issue of *Surgery, Gynecology and Obstetrics*, there is a very excellent article and analysis of "Carcinoma of the Rectum and Rectosigmoid" by Mayo and Fly from the Mayo Clinic. Their conclusion was that a lesion above the 6 cm. level to the 15 cm. level could be treated with anterior resection and end-to-end anastomosis with a five-year survival which was comparable, statistically, with the abdominal-perineal resection. Comparative figures being 50.8 per cent for anterior resection with end-to-end anastomosis and 54.8 per cent after combined abdominal-perineal resections. This is in a sta-

tistically significant series of cases. Waugh and his group published a series of cases of five-year survival after the abdominal-perineal resection with the pull-through sphincter preserving operation and had a five-year survival of 51.5 per cent. On the basis of studies of this sort it would seem that it would be necessary for us to keep an open mind on whether lesions should be categorized as to level from the anal sphincter as to whether or not the more mutilating procedure of abdominal-perineal resection should be carried out. I am thoroughly convinced that there are certain rather large lesions which occur at the 8 to 10 cm. level in which the prognosis might be better with the more radical procedure with permanent colostomy, whereas there are smaller lesions at a lower level that might be adequately treated by anterior resection.

In our present state of knowledge I don't believe we can categorically lay down any hard and fast rules as to the treatment of carcinoma at any particular level in the rectum and rectosigmoid. This, of course, brings up the question whether there are any carcinomas which should be treated by simple local excision without removal of all of the adjacent lymph node bearing tissue. There certainly must be a time when a carcinoma is localized without any spread to any adjacent tissues or to the adjacent lymph nodes and, with teaching being that the more radical operation should always be done for the smaller lesion, one cannot help but wonder whether rectums and sphincters are not being sacrificed needlessly in early cancers.

We have had occasion in the past four years to follow two patients who had as nearly identical lesions as it is possible to get. Both of these patients were in their middle fifties. At the time they were first seen both had a small carcinoma of the rectum on the posterior wall at 4 cm. from the anal verge. Each lesion measured approximately 1.5 cm. in diameter. Both of them were somewhat questionable, grossly. Both were treated by excision biopsy. On both resected specimens of the biopsy specimen, the pathologic report was that of invasive carcinoma. Both patients were advised to have abdominal-perineal resection. One patient agreed to this procedure and was subjected to it. The other one flatly refused to have a colostomy and chose to take her chances on recurrence and later abdominal-perineal resec-

tion if there was any recurrence. Up to this date both have been checked and followed at intervals of six months. I have seen both of these patients in the past thirty days. Neither one has any evidence of recurrences nor any evidence of distant metastases. It would seem that the patient with the more conservative operation has in this instance as good a chance of cure as the patient who was subjected to a considerably greater operation with a greater risk and resultant handicap in the form of an abdominal colostomy.

I was able to find in our files four other patients who had had small carcinomas in the rectal ampulla who also refused a more radical operation and who were treated by local excision of their tumor, and they have all had an excellent result. More than three years has elapsed since these four patients underwent surgery.

Within the past six weeks we had occasion to treat a patient who had a small sessile polypoid lesion at the 22 cm level. This lesion measured approximately 6 mm. in diameter. It was removed with a biopsy forceps and the base was thoroughly fulgurated. This was a patient in her middle forties and the pathologic examination revealed this lesion to be a Grade III carcinoma. The patient was advised to have segmental resection with end-to-end anastomosis. The entire sigmoid colon, lymph nodes and the entire mesentery up to the origin of the inferior mesenteric artery was removed with the resected specimen and an end-to-end anastomosis done. Serial sections through the base of the lesion failed to reveal any evidence of any tumor cells left and the lymph nodes were negative. One cannot help but wonder if in a patient of this type the fulguration and local removal were not adequate treatment.

In summary I should like to point out, first, that it seems greater attention to minor details of surgical technique could very well be responsible for improving our survival rates from carcinoma of the rectum and rectosigmoid as well as the rest of the colon.

Early and localized cancer of the lip has a good chance of permanent cure by irradiation. Surgery may be necessary for resistant, recurrent or late radiation ulcers.

* * *

It is inadvisable to attempt to treat a person for malignancy and pretend it is benign.

MAY, 1957

Second, I should like to re-emphasize that there is considerable question whether or not extensive and radical operations will significantly lower our mortality rate for carcinoma of these organs, particularly when one considers the greater mortality rate which is associated with these extremely radical, mutilating operations.

Third, in the treatment of low-lying lesions between the 6 and 15 cm. level of the rectum, the question of whether to do an anterior resection with end-to-end anastomosis or whether to do an abdominal-perineal resection with permanent colostomy is, I think, still far from settled, and at the moment it would seem that the better approach would be to individualize the lesions. The results which will be obtained by these two operations will perhaps be greatly dependent upon the operator's judgment of and previous experience with treatment of this disease.

Fourth, there are some lesions which certainly are amenable to treatment by local excision and our main problem seems to be to determine which ones can be treated in this manner and which ones would require more extensive operations.

Last, I believe the proper operation for any given carcinoma of the rectum or colon is that operation which will be radical enough to give that particular patient the best chance of a permanent cure with the lowest possible mortality rate in any given case. It is my feeling that we cannot categorize in the treatment of this disease, that each patient represents an individual case that must be evaluated on the basis of the findings and the patient's general condition, and the proper operation should be performed which will give that patient the best chance of being permanently cured.

I still believe in radical surgery for carcinoma and present these arguments as a stimulus to myself and to others to keep an open mind on a question which I feel is still not settled. We will see further changes in therapy of this disease and I am sure that the ultimate answer will lie in something other than surgery.

Doubt and fear may be more devastating than a knowledge of the true facts, even though the true facts in the case of incurable malignancy are certainly not the best.

* * *

A cancer patient who wishes to know what his condition is, is often actually relieved to know the bitter truth.

Poison Control Center—A Community Need

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ACCIDENTAL poisoning has become one of childhood's most common nonsurgical emergencies. This fact needs little emphasis for the pediatrician and practitioner who is all too frequently beset by the emergency calls concerning children who accidentally ingest poisonous substances. Physician awareness of the problem is now generally achieved, but less impressive progress has been made in prevention and treatment. Approximately 14,000 accidental deaths per year occur among children one to fourteen years of age in the United States. In 1954, there were approximately 1,400 fatal home poisonings.¹ As significant as these numbers may be, they fail to convey the staggering morbidity of nonfatal poisonings which outnumber the fatalities many hundreds to one.

Advances in chemistry, manufacturing processes and distribution have put tremendous numbers of potential toxic substances in nearly every modern household, and especially on the farm. The Committee on Toxicology of the American Medical Association estimates that over 250,000 trade name substances are currently on the market. The physician is frequently frustrated in an effort to determine from the information on hand the toxic ingredient of many common household agents. The problem is further compounded because the formulas of many of these substances are trade secrets and from time to time their ingredients may be changed and altered without changing the original name of the product.

Thus has come a need of physicians from all parts of the country for up to date information on toxic ingredients in common substances found in modern homes and farms. This has been an important stimulus for the formation of poison control centers.

In 1950, the American Academy of Pediatrics recognized the importance of the acute poisoning problem in children by authorizing and appointing a committee on Accident Prevention. Through

the stimulus of the Academy and its Accident Prevention Committee, there are now functioning eighteen poison control centers in cities of the United States.² Such centers collect and process data on the incidence and type of poisons encountered. Such local control centers, cooperating with the other state and national centers could provide prompt information on toxic ingredients and the treatment for a particular agent in the bewildering array of poisonous substances ingested by children. As a result of information already gained through these functioning centers, a most useful reference guide to the chemical constituents of common household substances together with treatment recommendations has been published.³

TABLE I. ACCIDENTAL POISONING*

1951	77 cases
1952	100
1953	159
1954	296
1955	236
Total	868 cases

*From Emergency Room Records, Northwestern Hospital.

TABLE II. POISONING CASES—DISTRIBUTION BY AGE

	Totals	6-11 months	12-17 months	18-23 months	2 yr.	3 yr.	4-8 yr.
Males	499	22	44	126	137	118	52
Females	369	17	41	106	95	80	30
Total	868						

Data

A summary of data on accidental poison ingestion in children under fifteen years over a five-year period, as recorded in the emergency room of Northwestern Hospital, Minneapolis, Minnesota, is presented. The total number of cases reviewed was 868. (Table I) When one realizes this general hospital is one of thirteen serving the metropolitan area of Minneapolis, the total morbidity for the area, if calculable, would be impressive.

As is well appreciated, the curiosity of the toddler results in children in the age group of eighteen months through two years encountering poisons most frequently (Table II). Boys in each

Read at the fall meeting of the Northwestern Pediatric Society, Bayport, Minnesota, September 28, 1956.

POISON CONTROL CENTER—SCHROEDER

TABLE III. POISON CASES—TOTAL 868

Group I	Medicine, internal and external	516 cases 59%
Group II	Household Substances	135 cases 15%
Group III	Pesticides	90 cases 10%
Group IV	Miscellaneous, unclassified	127 cases 14%

TABLE V. NUMBER ONE PROBLEM
868 CASES

Aspirin		363 cases
"Candy"	80%	310 cases
"Regular"	20%	53 cases

TABLE IV. COMMON TYPES OF POISONS
BASED ON 868 CASES

	Cases	% Total
Aspirin	363	42%
Hydrocarbons	95	11%
Paint Products		
Arsenic	45	5%
Codeine	34	4%
Strychnine	32	3%
Barbiturate	32	3%

TABLE VI. TOTAL POISONINGS (1951-1955)
868 CASES

Admission to Hospital	41
Aspirin	15
Barbiturates	7
Hydrocarbons	6
Strychnine	4
Atropine	2
*Digitalis	2
Morphine	2
Codeine	1
Soap	1
Nicotine	1
*Fatal	1

age group and in the total series outnumber girls.

An analysis of cases by groups is presented in Table III. Medicines, (group 1) conventionally considered under household substances, have been considered separate to emphasize their importance. If all medicines could be kept in the medicine chest and the medicine chest locked, the major source of poisons in this series could be eliminated.

Under household substances (group 2) are included cosmetics, toilet goods, cleansing, polishing, and sanitizing agents, disinfectants, fuels et cetera. The variety of these products runs into the thousands.

Pesticides (group 3) consist of a large group of chemicals for use as insecticides, herbicides, fungicides, rodenticides, and insect repellents. These are generally highly dangerous poisons.

The most common types of poisons encountered in this series are found in Table IV. Largely responsible for the prominence of aspirin as a poison is its popularity and wide distribution in special flavored forms. As all who deal with this problem are well aware, "candy aspirin" presents our most frequently encountered drug. (Table V) Since 1932, candy aspirin has been sold as a prescription drug, but only since 1948 has the flavored form of children's aspirin had been distributed as an over-the-counter remedy. This type of aspirin is sold largely through drugstores where it now constitutes approximately 12 per cent of the total aspirin sales.⁴

Of the 868 cases of ingestion poisonings encountered, forty-one or 5 per cent required admission and treatment in the hospital. (Table VI) There was one fatality, this due to ingestion of Digitoxin by a two-year-old girl.

In the State of Minnesota during the five-year period of this study (1951-1955), there were thirty-nine deaths due to poisonings by ingestion in children under fifteen years, and all but one were under the age of five years.⁵ The state morbidity figures for accidental poison ingestion in childhood, judged by the numbers encountered in one metropolitan hospital emergency room, must indeed be impressive.

Summary

1. The data on cases of accidental poison ingestion in children encountered in a metropolitan hospital emergency room are presented. These results are summarized in tabular form.

2. A wealth of information and experience in accidental poisoning in children passes through our hospital emergency rooms yearly. This information, now largely lost, could be processed and correlated through the function of a poison control center. Such a center would contribute to *education* in the subject, stimulate means of *prevention*, and improve *treatment*.

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Case Presentations

Effect of Bilateral Adrenalectomy on Diabetes Mellitus

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THE RELENTLESSLY progressive vascular disease seen in some patients with diabetes mellitus is a grave yet stimulating medical problem. Juvenile diabetic patients are especially prone to have premature arteriolar degeneration, with vascular lesions making their first appearance from five to fifteen years after the onset of clinical diabetes.¹

Microaneurysms in the retinal arterioles are often easily recognized in the early stages of vascular degeneration and the kidney frequently follows as a major clinical area of impact.² Kimmelstiel and Wilson³⁻⁵ described a clinical syndrome in diabetic persons associated with intercapillary glomerulosclerosis characterized in the advanced stages by hypertension, retinitis, nitrogen retention, proteinuria and hypercholesterolemia, with eventual renal failure and death.

The exact etiologic stimulus for the production of these vascular changes has not been found, but it appears possible that such vascular degeneration represents a disease of adaptation.⁶⁻⁸

McCullagh and Alivisatos⁹ pointed out that diabetes mellitus must be looked upon as a group of diseases that have hyperglycemia as a common feature. Long-sustained hyperglycemia, whatever its cause, may in some persons precipitate lasting pancreatic diabetes. In addition, hyperglycemia is a fairly potent stress factor capable of increasing the susceptibility of diabetes to the so-called adaptation response.¹⁰ Insulin hypoglycemia is likewise a stress factor in that insulin shock is a

potent stimulant of adrenal cortical dysfunction.¹¹

Kinsell and his group¹² considered clinical diabetes to be the relative or absolute lack of the hypoglycemic factor and the relative or absolute excess of pituitary, adrenal and possibly other hyperglycemic factors. They suggested that a major factor in the vascular degeneration in persons with diabetes may be the constant disturbance of intracellular and extracellular osmotic relationships resulting from extreme fluctuation in blood sugar over months and years.

In 1953, Poulsen¹³ reported the disappearance of diabetic retinal lesions in a female with longstanding diabetes following the onset of Sheehan's syndrome. He suggested, as did Kinsell and co-workers and McCullagh and Alivisatos, that diabetic retinopathy is the manifestation of a metabolic hormonal disorder characterized not only by lack of insulin but also by the unrestrained action of the pituitary and adrenal hormones. Similarly, Becker¹⁴ showed that retinal microaneurysms can be produced by the injection of corticotropin into rabbits rendered diabetic by alloxan. Vascular lesions associated with Cushing's syndrome likewise suggest that excessive adrenal cortical steroids have a direct etiologic relation to the vascular damage. However, it has not been shown that the so-called steroid diabetes of Cushing's syndrome causes diabetic retinopathy more frequently than does clinical diabetes mellitus.

Hypoglycemic and hyperglycemic stress factors and resultant adrenal cortical dysfunction are readily recognized in the clinical course of most patients with diabetes in whom early vascular degeneration is prone to develop.² On this basis, it would seem that diabetic persons who have evidence of vascular disease would benefit most from rigid control that would lessen stress and, consequently, support adrenal cortical function. Such rigid control is at least difficult in the ma-

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jority of cases, a fact which gave stimulus to the thought that total bilateral adrenalectomy might modify the arteriolar degenerative lesions of diabetic patients.^{2,12,15} The fact that in Poulsen's patient, mentioned above, the hypopituitarism was marked initially by symptoms of severe hypoadrenalism lent further substance to this concept.¹⁵

Reports in the Literature

The first favorable result from bilateral subtotal adrenalectomy upon the vascular disease of a patient with malignant hypertension in association with severe diabetes mellitus was reported by Green and associates.^{16,17} Evaluation of this patient nine months and fifteen months after operation indicated that progress of the renal and other vascular lesions had been arrested. The patient's diabetes was improved greatly, with insulin requirements proportional to the amount of adrenal cortical extract administered. Subsequently, ten patients with diabetes mellitus and associated severe vascular disease treated by total bilateral adrenalectomy have been reported in the literature.

Wortham and Headstream^{2,15} reported a series of seven diabetic patients with retinopathy and other evidence of advanced renal disease. Of this series, two patients showed postoperative remission of vascular degeneration as evidenced by minor reversal in retinopathy, return of blood pressure to normal, decrease of proteinuria and nitrogen retention, and clearance of edema. In two cases, there was no further progression of pathologic features but less consistent improvement. Another patient demonstrated initial minor evidence of improvement but died of adrenal insufficiency after leaving the hospital. Of the remaining two patients in their series, one died of a cerebral vascular accident four and one-half months after operation and the other died of pulmonary and myocardial infarction four months after operation.

Hamwi¹⁸ reported two cases in which clinical improvement was manifested by ability to work and disappearance of retinopathy and edema. He denied, however, any significant improvement in the stability of the diabetes in these patients.

Martin and Wilson¹⁹ reported the case of a twenty-eight-year-old housewife with diabetes and advanced renal disease who underwent total bilateral adrenalectomy. Postoperatively, the patient was controlled by oral use of cortisone and

DOCA given intramuscularly. Proteinuria failed to decrease in this patient but the urinary excretion of sodium increased. Malignant hypertension developed when 50 mg. of cortisone was given daily.

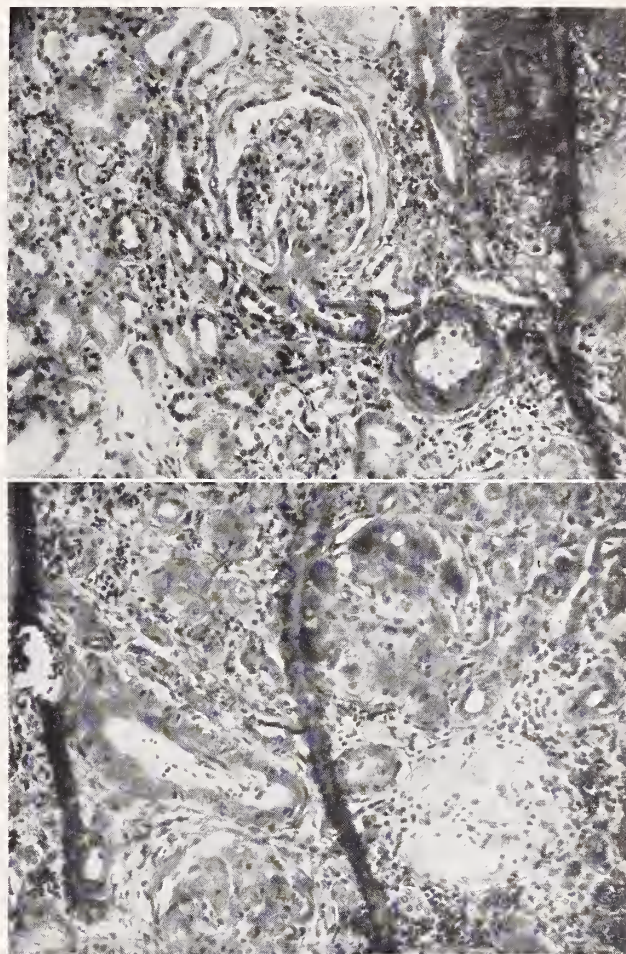


Fig. 1. (*above*) Advanced arteriosclerosis of the kidney. (*below*) Intraglomerular hyaline bodies in the kidney. From the Department of Pathology, The Charles T. Miller Hospital, St. Paul, Minnesota.

The patient died of adrenal insufficiency with hyperkalemia and rapidly ascending muscular paralysis when, in an attempt to relieve the malignant hypertension, the dose of cortisone was reduced from 50 to 25 mg.

We would like to report the case of another young diabetic patient with associated vascular disease who underwent total bilateral adrenalectomy.

Case Report

The patient was first admitted in December, 1952, for the treatment of a fracture of the right tibia and fibula. He was twenty-three years of age and had had diabetes for twelve years. Examination at this time revealed cotton-wool exudates in the left eye, a normal right eye, and a borderline blood pressure of 140/80. The urine disclosed 3 plus albumin and 4 plus sugar;

there were ten to fifteen erythrocytes and fifty to sixty leukocytes per high-power field in the sediment. The blood urea nitrogen was normal. The serum contained 2.8 gm. of albumin and 3.8 gm. of globulin per 100 ml. Several subsequent admissions were necessary for the continued control of his diabetes and for the treatment of acute hypertensive encephalopathic episodes that were confused with and at times accompanied by insulin reactions. These episodes were marked by blurred vision in the right eye and loss of vision concomitant with the appearance of microaneurysms and retinal edema in that eye.

Because of the episodic nature of the hypertensive crises, the presence of a pheochromocytoma was suspected and several tests were performed during the ensuing months. The regitine test usually gave negative results, but in May, 1954 a positive histamine diphosphate test was obtained, during which the patient's blood pressure rose from a basal level of 145/100 to 200/130 and there was simultaneous onset of severe bilateral frontal headache and retrobulbar pain. Further studies at the University of Minnesota failed to confirm the abnormal histamine test, but regitine tests were typical, showing a decrease of approximately 25 mm. of mercury in systolic and diastolic blood pressure. Accordingly, the patient was explored for a possible pheochromocytoma on October 10, 1954. A tumor was not identified and, after thorough exploration, total bilateral adrenalectomy was performed in an attempt to prevent future hypertensive episodes and perhaps curtail further vascular degeneration.

Postoperatively, the patient was hospitalized on a number of occasions in an acute febrile state accompanied by sudden and severe hypotension necessitating additional adrenal cortical extract. His supportive therapy consisted of cortisone, 30 mg. daily, DOCA 2 mg. daily and 40 units of NPH insulin, which represented some decrease in his total insulin requirements.

Following these University Hospital admissions, he was again seen at Miller Hospital in hyperglycemic episodes accompanied by hypertensive encephalopathy. He was now given hydrocortisone orally and maintained on a split NPH insulin schedule of twenty-eight units every morning and eight units at suppertime.

Severe weakness of the extremities with apparent inability to move them voluntarily next ensued, and he was admitted on February 8, 1955, for treatment of this condition. Cortisone apparently possessed the ability to give him a feeling of normalcy. It was considered that he was suffering from hyperkalemia caused by hypoadrenalism, and this was substantiated by blood chemical studies, which revealed a blood sugar of 880 mg. per 100 ml., a blood urea nitrogen of 42 mg. and serum potassium of 9.6 mEq. per liter. Treatment with insulin, hydrocortisone and saline produced prompt remission of his symptoms.

His last outpatient visit occurred on May 31, 1955, at which time he complained of weakness, leg cramps early in the morning and easy fatigability of one week's duration, accompanied by anorexia, nausea and loose

stools. Blood studies the following morning showed the following: urea nitrogen, 40 mg.; serum chloride, 101 mEq. per liter; serum sodium, 135 mEq. per liter and serum potassium, 5.9 mEq. per liter. On the same evening, he continued to complain of anorexia and ate very little for supper. He did, however, visit with a friend and went for a ride, returning home about midnight, after which members of his family found him lying quietly in bed reading the newspaper; he stated he felt well. Approximately one hour later, he awoke screaming and immediately became comatose. He was brought to the hospital at 2 a.m. but was dead on arrival.

Immediately after arrival at the hospital, blood was drawn from the cardiac chambers and demonstrated a sugar of 1,286 mg.; values for serum chloride, sodium and potassium, respectively, were 92, 121 and 12 mEq. per liter.

Postmortem examination revealed extensive hyalinization of the glomeruli, with advanced arteriolosclerosis and scattered foci of lymphoid infiltration. There were also occasional intraglomerular hyaline bodies (Fig. 1).

At least twelve cases of total bilateral adrenalectomy in diabetic patients with advanced vascular disease have now been reported and there are certainly others not yet documented.²⁰ Of these twelve patients, five died postoperatively due to either adrenal insufficiency (three) or continued progression of the degenerative vascular lesions (two).

Conclusions

It appears that at least one reason for the unfavorable outcome of adrenalectomy in this series of cases lies in the advanced degree of vascular deterioration that always has been present before operation was considered. As a result, several authors have advocated that patients with evidence of severe vascular and renal deterioration, significant nitrogen retention, proteinuria in excess of 5 gm. daily and diastolic blood pressures more than 120 mm. of mercury should be excluded as candidates for adrenalectomy.

Consideration of total bilateral adrenalectomy as a therapeutic measure in the initial stages of arteriolar degeneration would appear to represent radical therapy, but it is evident that procrastination until the vascular or renal lesions have reached the stage of irreversibility has not been successful. As an ancillary procedure calculated to prolong life in a diabetic patient with advanced vascular disease, total adrenalectomy does not appear to deserve approbation.

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SENSITIZATION TO BLOOD ANTIGENS

(Continued from Page 304)

transfusions, they do become important and can cause reactions.

Summary

1. Six cases are reported in which Rh₀ (D) positive persons have become sensitized by transfusion or pregnancy to one or more of factors rh" (E), hr' (c), Kidd (Jk^a), Duffy (Fy^a), P and Lewis (Le^a).

2. It is not correct to assume that only Rh negative patients are capable of becoming sensitized.

Acknowledgment

We are pleased to acknowledge the assistance of Drs. R. R. Race and Ruth Sanger, Blood Group Research Unit, Lister Institute, London, for confirming the serologic findings in cases 3, 5 and 6, and to Dr. T. J. Greenwalt, Milwaukee Blood Center, for confirming our findings in case 4.

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Impending Occlusion of the Central Retinal Vein

VERNON L. LINDBERG, M.D.
Minneapolis, Minnesota

P. D., first seen at 1:00 p.m. on January 7, 1956, was a healthy white man, fifty-three years old. He stated that he awakened and noted blurred vision in his left eye the same morning. He was alarmed by this symptom and sought the advice of his ophthalmologist about noon of the same day.

At this time his corrected vision was found to be right eye, 20/20; left eye, varying between 20/50 and 20/100. The intraocular tensions were within normal limits. Examination of the left fundus revealed dilatation of the entire venous system of the retina. The veins were distended and dark blue in color. A small flame-shaped hemorrhage was noted on the temporal edge of the disc, and about six or eight other tiny punctate hemorrhages were seen. The right fundus was normal.

A working diagnosis of partial or impending occlusion of the central retinal vein of the left eye was made. The patient was immediately admitted to hospital and anticoagulant therapy was begun.

The following morning (January 8, 1956) at 10:30 a.m. he was re-examined, and at this time he stated that he believed the vision in his left eye had improved considerably. His corrected vision was found to be 20/20 in both eyes.

On examination the right fundus was normal, but the left fundus showed dilatation of the retinal veins, not as much as the previous day, but the veins were still definitely distended and bluish in color. The small retinal hemorrhages were noted as previously, but no new hemorrhages were seen. The patient was seen daily until his discharge from the hospital on January 17, 1956. Each day the visions were checked and found to be normal in both eyes.

Laboratory examinations, including occult blood in the stools, serology, hemoglobin, white blood count, sedimentation rate, blood cholesterol, blood fasting sugar, and urinalysis were all found to be negative or within normal limits. The electrocardiogram and chest x-rays were normal. The patient had pronounced varicosities in his right leg, but this was not considered significant.

On admission, a Lee-White clotting time and prothrombin time were obtained. Dicumarol was started with an immediate dose of 250 mg.; 175 mg. was given the second day, and thereafter the daily dosage was adjusted according to the prothrombin time.

Until the second day when the prothrombin time was twice that of the control, the patient's effective anti-

coagulant therapy was Depoheparin. This was begun immediately on arrival in the amount of 100 mg. intramuscularly. Within three hours the Lee-White clotting time was prolonged to twenty-four minutes, fifteen seconds; thereafter, the clotting time by this method was checked twice daily and if it was less than the desired range of twenty to thirty minutes, then 50 mg. of intravenous heparin was added.

The patient's prothrombin time was maintained between two and three times that of the control. Dicumarol therapy was continued ten days in the hospital until his dosage requirement was reasonably stable at 75 mg. per day. He was then discharged on ambulatory anticoagulant dicumarol therapy, with prothrombin time determinations made twice weekly for three weeks.

Corrected vision in his left eye on all office visits until the date of discharge, February 21, 1956, was found to be 20/20. On discharge, the left fundus showed complete absorption of all hemorrhages and the only positive finding was perhaps a slight dilatation of the venous tree of the left retina.

In the differential diagnosis, optic neuritis would have to be considered, but the therapeutic test definitely ruled this condition out. The fact that the condition was unilateral would tend to rule out the possibility of blood dyscrasia.

The fortunate outcome in this case depended largely on the fact that the patient was seen early in the course of his illness, and as a result specific therapy was introduced in time to be effective.

Writings on occlusion of the central retinal vein indicate that the prodromal symptoms of transitory obscurations of vision sometimes precede the complete stoppage of the central retinal vein by as long as weeks or months. This illustrates the fact that thrombosis of the central retinal vein is amenable to treatment if the diagnosis is made early (in contrast to occlusion of the central retinal artery where early emergency treatment is seldom effective).

Unfortunately, the usual results in this condition are poor. By the time the diagnosis is made in the average case, the central retinal vein has completely thrombosed and the retina is choked with massive round and flameshaped hemorrhages,

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Presented at the annual meeting of the Southern Minnesota Medical Association, New Ulm, September 10, 1956.

Primary Cutaneous Myiasis

J. C. WOHLRABE, M.D.
Saint Clair, Minnesota

On August 6, 1956, a seventy-nine-year-old retired farmer came to my office in the evening complaining of bleeding. He had never been ill, never had any surgery, and in recent years had not traveled more than a few miles from his home in Blue Earth County, Minnesota. He had not been feeling well for several weeks and consulted me only because he feared that he might bleed to death.

The penis was bandaged in rags and blood flowed slowly from a 2 mm. opening in the left inguinal area at the base of the penis. There was erythema and induration for a radius of about 2 cm. around this opening. On further examination, four other lesions resembling furuncles were found on the medial aspects of the knees and thighs and one on the dorsum of the penis near the base. There was no extension of inflammation beyond the immediate area of each lesion. One of the lesions on the thigh was opened and a single maggot, 10 mm. long, was recovered. The patient was hospitalized, given penicillin and streptomycin, and scheduled for incision of the remaining lesions in the morning.

Laboratory findings were not noteworthy except for a leukocyte count of 12,100, with a differential of seventy-eight polymorphonuclear cells, one band cell and twenty-one lymphocytes.

Each lesion was opened. One additional larva was recovered. It was later learned that, while the orderly was preparing the patient for surgery, two larvae had emerged and were destroyed by him. Two of the lesions were apparently already vacated. To my knowledge, none contained more than a single maggot.

The two living maggots that had been recovered were placed in tubes containing small strips of beef and human muscle. One was mailed in this fashion to the Department of Entomology of the University of Minnesota for identification. The other was kept in its tube for two days and then it and the meat fragments were dumped into a fruit jar containing several inches of earth. After another day, it disappeared into

the dirt and was assumed to have formed a pupa. This jar was then also mailed to the University of Minnesota. Both specimens died (one went to the wrong office and was lost for several weeks). Positive species identification could not be made.

The patient's lesions healed uneventfully within a week.



Fig. 1.

The suggestion that this might be a case of *Wohlfahrtia vigil* was made. Reports have been made of primary bites in infants as far north as Toronto, Canada. To my knowledge, no cases of primary bites in adults have been reported in this area.

IMPENDING OCCLUSION OF THE CENTRAL RETINAL VEIN

(Continued from Page 322)

there is little, if any, collateral circulation in the retina and, as a result, complete thrombosis of the central retinal vein usually result in almost complete loss of vision. A late complication is the development of secondary glaucoma with frequent loss of the eyeball itself, because of the develop-

ment of a blind painful eye.

The symptom of transitory obscurations of vision in one eye, in a patient who has never had similar previous episodes of visual loss, should be treated as an ocular emergency until the real cause is established.

Continuation Study

Selection of Patients for Cardiac Surgery

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THE MOST important function of the clinician and cardiologist on the cardiovascular team is the determination of the specific diagnosis or specific combinations of malformations that may be surgically treated. Rapid progress has been made in the area of diagnosis of congenital malformations of the heart by the use in recent years of angiocardiography, heart catheterization, and dye dilution techniques. The history, physical examination, electrocardiogram, x-ray studies and fluoroscopy still remain important considerations in arriving at the final diagnosis. The increasing number of malformations now amenable to surgical cure, and our realization that many of these malformations may produce death if undiagnosed and untreated at a few weeks or a few months of age, have extended the problem of diagnosis into comparatively unknown areas.

A simple generalization which has been helpful to me in understanding the complexities involved in selection of patients for cardiac surgery is to consider that each individual patient represents a balance or a gamble between the useful life expectancy and the gains expected and risks involved from surgery. The clinician's, surgeon's, and the parent's attitude toward these risks should be in reasonably close agreement.

One approach to determining the full life expectancy is to use the tables found in the literature stating the age at death from various specific malformations. The medium ages at time of death for a few of the common malformations are listed in Table I as reported by Abbott¹ and later by Edwards and Fontana.² Many of the values given are in remarkable agreement, others are completely divergent. The time of death is not the best point to judge the severity of a given defect. If a patient who lives to be forty years has been bedridden, handicapped, incapacitated for the past twenty years of his life, it is not to be considered

as adequate merely to extend the length of life. Rather the goal should be to eliminate the handicapping period preceding this and also to extend life expectancy.

TABLE I. LIFE EXPECTANCY OF PATIENTS WITH CONGENITAL MALFORMATIONS OF THE HEART

	Abbott Atlas	Edwards and Fontana
Atrial septal defect		
—Ostium secundum	34 years	50 years
—Below	19 years	
A-V canal		15 months
Ventricular septal defect	14 years	9 weeks
Patent ductus arteriosus	24 years	23 years
Pulmonary stenosis	22 years	23 years
Tetralogy of fallot	12 years	3 years
Transposition	2 years	8 weeks

A more helpful and realistic approach to the problem is to consider that each individual malformation or group of malformations has a spectrum of severity. It is now well known that children with a simple, correctable defect may die at a very young age even though the greater majority have a fair life expectancy and a very few may have a normal life expectancy. Figures available from our own State Department of Health and from other centers indicate that the statistical chance for survival of an infant with a malformation of the heart for more than one year if untreated is only 50 to 60 per cent. Because patients with surgically curable defects are dying at an early age we now realize that the greatest source of salvage of life is in the infant age group. A few of the helpful signs which indicate the urgent need for specific diagnosis and surgery at any age are listed below:

1. Early heart failure not responding to adequate medical therapy. Infants with coarctation of the aorta are a most frequent group of patients who fit into this group. Heart failure may often occur in the first few weeks of life and the aortic block may be successfully removed even at this early age.
2. Failure to gain weight adequately. To me this has

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been a most helpful and objective finding indicating a markedly shortened life expectancy.

3. Frequent pneumonias which respond poorly to treatment. Occasionally a few infants with a very rocky course of repeated respiratory infections and

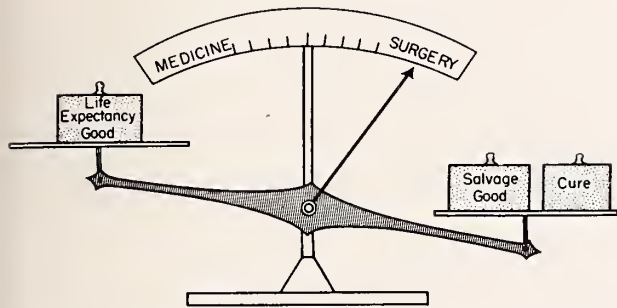


Fig. 1. "Curative" Procedure. Surgery indicated as elective procedure when diagnosis is established:

1. Patent ductus arteriosus
2. Coarctation of aorta
3. Vascular ring
4. Pulmonary valvular stenosis (Broch procedure)
5. Cor triatriatum
6. Tumor

a failure to gain weight during the first year of life will unexpectedly show dramatic improvement and be relatively free of difficulty for the next several years. Unfortunately, there is no good way of predicting which children will do this and, because they are in the minority, the findings of poor weight gain and repeated infections must remain an important indication for early diagnosis and surgery.

4. Cardiomegaly and progressive pulmonary hypertension are always alarming. In the present state of our knowledge, it appears that pulmonary hypertension may advance to equal the systemic pressure and that surgery may still be carried out with a reasonable hope of survival. However, once the pulmonary pressures have exceeded the systemic pressures so that the patient is now shunting right to left and exhibits either transient or constant cyanosis, surgery appears to be definitely contraindicated because this finding appears to represent a definite progression of pulmonary disease to the point where it is irreversible, and survival from surgery is impossible.
1. Marked dyspnea or increasing frequency and severity of cyanotic episodes. This is mentioned in connection with the diagnosis of pure valvular stenosis with intact ventricular septum and tetralogy of Fallot, since the above mentioned indications are less frequently found in these malformations.

On the other side of the balance, the risks of surgery and the gains expected must be evaluated. The risks of surgery may be expressed as mortality rates, but this fails to take all facts into considera-

tion. For example, if good risk patients only are operated upon, mortality rates are low. Poor risk patients are then permitted to die without any surgical attempt at helping them. If, on the other hand, no patient with a correctable malformation is refused surgical help regardless of the young age or physical condition, then mortality will be higher. However, if there are any survivors, then the overall number of patient years of life salvaged will have been greatly increased. This has been the aim of the cardiovascular team at the University of Minnesota. The term "salvage" is therefore used in the illustrations that follow rather than "mortality."

Surgical procedures may be roughly grouped into three categories depending on the gains that may be expected: (1) curative procedures, (2) palliative procedures, and (3) developmental procedures with unproven results.

Figure 1 will serve to illustrate the important relationships of the gains expected and the risks of surgery in the selection of patients. This balance represents the surgical procedures which may be reasonably considered to result in a cure. In the malformations listed in this group the overall life expectancy is predominantly good and symptoms are often entirely absent or minimal. Nevertheless, there are probably 5 or 10 per cent of patients with these curable malformations who will not survive the first year of life, if untreated.

In general, curative procedures involve a greater salvage or lower mortality than palliative or developmental procedures. This may be explained on the supposition that following the procedure the patient has a more nearly normal heart with which to help him recover through the critical postoperative phase.

Therefore, even though the patient may be asymptomatic, surgery is still strongly considered as an elective procedure as soon as the diagnosis is made. Procedures for the malformations listed, namely, vascular ring, pulmonary valvular stenosis, cor triatriatum, and certain cardiac tumors, are not as clear-cut curative procedures. Surgery may be recommended in such instances in the absence of clinical symptoms, but various degrees of abnormal physiologic findings should be present. For example, in pulmonary valvular stenosis the right ventricular pressure should be markedly elevated into the neighborhood of 100 mm. of mercury before surgery is considered.

Figure 2 illustrates the process of thinking in the patients where only palliative surgery is available. Here you will notice that the salvage rate is generally less favorable and the fact that palliation

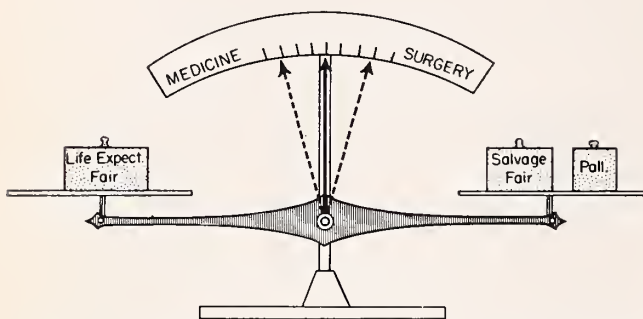


Fig. 2. Palliative Procedure. Surgery indicated when handicapping symptoms or findings appear:

1. Tetrad (Blalock-Taussig)
2. Nonfunctioning right ventricle
3. Mitral stenosis
4. Aortic stenosis—transventricular—retrograde
5. Single ventricle (artificial pulmonary stenosis of Muller)

only is obtained carries less weight toward indicating surgery in such patients. Newer and better techniques may be available within a few months or a few years so that delay as long as it appears to be reasonably safe seems indicated.

Figure 3 illustrates the philosophy that is concerned with new and developmental procedures. You will notice here that the weights indicating surgery are of more questionable significance and, therefore, the indications for surgery in such instances are in people who have an extremely poor life expectancy. This obviously places the surgeon at a disadvantage. The surgeons in our institution have gladly accepted this philosophy. If an end-stage patient has been brought successfully through surgery, this is very impressive to the clinician and the balance may rapidly swing after a certain number of cases over toward the first or second categories that have been illustrated.

In conclusion, I would not feel right if the most important single factor involved in the final decision for surgery were not mentioned. Unfortunately, in such a discussion it is often most neglected or passed over too lightly. This involves the attitude of the parents toward surgery. The line of least resistance would be for the physician to assume full responsibility. Many parents would rather have someone else make such an important

choice. This tendency must be conscientiously and emphatically avoided in the ideal situation. To avoid this, our procedure has been to diagram, to explain, and to discuss the diagnosis with the par-

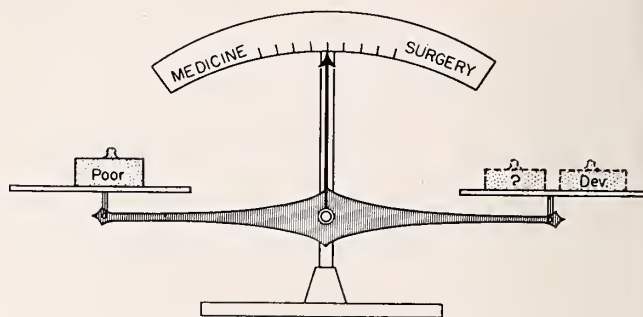


Fig. 3. Developmental Procedure. Surgery indicated only when life expectancy is poor:

1. Atrial septal defect
 - (a) Hypothermia
 - (b) Gross atrial well
 - (c) Bailey septo-pexy
2. Ventricular septal defect
 - (a) Cross-circulation—(now obsolete)
 - (b) DeWall bubble oxygenator
 - (c) Gibbon pump
3. Tetralogy of Fallot
4. Infundibular pulmonary stenosis
5. Pulmonary valvular stenosis—retrograde
6. Ostium primum syndrome—A-V canal
7. Transposition of great vessels
8. Total anomalous pulmonary venous drainage
9. Endocardial fibrosis—talcum in pericardium

ents. The life expectancy is discussed. The type of surgery, the risks, and expected results are outlined. Parents are then given as much time to make their decision as they require. They often discuss this with their family doctor, the other members of their family, their religious counselor and with the patient, in the case of older children. If the final decision is to have surgery, they then ask the surgeon to proceed. There should be no feeling of having been pushed into the decision against their better judgment. This approach, we believe, creates a more healthy psychologic attitude for both the physician and parent, regardless of the outcome of surgery.

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Editorials

JOHN F. BRIGGS, M.D.
ARTHUR H. WELLS, M.D.
HENRY G. MOEHRING, M.D.

CRIMINAL RESPONSIBILITY

Recent psychiatric and legal literature seems to reflect an ever-increasing interest in, and concern with, the matter of criminal responsibility. Generally, the articles that have been published in both legal and psychiatric journals have been critical of present laws governing criminal matters and, in particular, have expressed dissatisfaction with the outmoded M'Naghten Rule. The question of responsibility in criminal behavior is an important matter and one that merits more consideration, especially by psychiatrists and other physicians who are concerned with examining people charged with crimes.

Like many customs and laws, our present ideas about criminal responsibility are rooted firmly in tradition. In Great Britain 114 years ago, Daniel M'Naghten made an attempt on the life of the British Prime Minister, Robert Peel, but mistakenly killed Edward Drummond, the Prime Minister's secretary. At the trial, the defendant through his counsel, Alexander Cockburn, pleaded not guilty by reason of insanity. The jury, after hearing all the evidence including the testimony of nine medical witnesses, all of whom testified that M'Naghten was insane, found the defendant "not guilty, on the ground of insanity." Although the trial was fair and there seemed little doubt that M'Naghten was insane, the acquittal caused unrest in the population. People found it impossible to believe that the murder had resulted from M'Naghten's mental illness. Even Queen Victoria protested the decision. Eventually, the House of Lords, under the influence of the Crown, asked fifteen English judges to give their opinions on the law governing such cases. After taking the matter under advisement, their collective opinion was to the effect that an accused was not responsible if he was "labouring under such a defect of reason, from disease of the mind as not to know the nature and quality of the act he was doing; or, if he did know it, that he did not know he was doing what was wrong."

This collective decision rendered by the fifteen British Justices became known as M'Naghten's

Rule. It is more popularly referred to as the "Right-or-Wrong Test" and forms the basis of insanity as a defense in criminal matters in most English-speaking countries and in nearly all of the states in this country, including Minnesota. It is this rule which has largely shaped our present legal concepts of criminal responsibility. However, most serious students of the subject—legal, judicial, or psychiatric—regard M'Naghten's Test as an arbitrary, inflexible rule with little positive relationship to psychiatric or scientific fact. In actual practice, it is difficult and oftentimes impossible for the psychiatric or medical witness justly and honestly to present his findings and opinions within the rigid and restricted framework of the Right-or-Wrong test. For one thing, almost anyone except a person with extreme mental deficiency or severe delusional or regressive psychosis can distinguish right from wrong in some measure, and such cases seldom ever come to trial. What is needed is a new law which does not force the psychiatrist or medical expert to confine his testimony to the narrow limits of the Right-or-Wrong Test (which is really a moral, not a psychiatric decision) but allows him to report fully his evaluation and opinions. He should not be forced to make a "legal" diagnosis of mental illness on the basis of one symptom, any more than a pathologist or internist should be compelled to make a "legal" diagnosis of malaria on the basis of temperature alone.

Recently, there have been some breaks with the M'Naghten tradition, notably in Washington, D. C., where in the Durham case the court held that the old rule was no longer adequate. Instead, it was ruled that an accused is not criminally responsible if his unlawful act was the product of mental disease or mental defect. It is to be hoped that other jurisdictions, including our own state, will soon consider adopting laws which recognize the need to revise and modernize existing formulae and statutes so that they will conform to present-day psychiatric knowledge.

CLARENCE J. ROWE, M.D.

DANGLE

When you acquire a bit of freedom from the pressure of assuring food, clothing, and shelter for you and yours, then you have leisure. And leisure is what it takes to indulge in contemplative thinking. A philosopher* tells us that useless knowledge also contributes to the habit of contemplative thinking; indeed, that that may be the only worth of useless knowledge. We keep hearing about how people of this modern age are in such a headlong hurry that they never take time for contemplative thinking. So maybe you should expend this leisure on some contemplative reveries of the past: Have you gotten what you want out of life? Have you lived your life thus far? What in your nature has brought you pleasure and what displeasure? What would you change if you had it to do over again? Or, if that is too painful, maybe you should plan—or even *scheme*—for the future. How can you acquire more leisure? What are you going to do with it?

To you who contend that you have no leisure, we can only quote the earthy comment of an observant dentist who states categorically that *a man will do what he wants to do*. So don't try to squirm out of this problem by saying to yourself you have no time to spare.

All this sounds good. Take a trip to Europe *next* summer. Get a hunting group together *next* fall. Take off every week end to attend football games *next* season. Wonderful ideas, and a certain amount of day dreaming about the future is indeed pleasure in the present. But look about you for an instant. Here you are in the present, in a respected position in your community, the source for guidance and critical advice to your patients, productively busy yet with enough leisure to be reading an editorial page. Plenty of cause for happiness, without regard for the past or future, exists in the here and now.

All in all, man is so occupied with the ties that bind him to the past and the future that he fails to pause often enough to enjoy the present. We see no reason to remind physicians that life is not a static thing, that it is in a state of flux. But we *do* see reason to remind you that you will

never again be able to dangle your feet in this same water in the stream of time, so start dangling—enjoy the present.

H.G.M.

CONFESSIONS OF A HOBBYIST

In one of his essays on education, the late Dean Briggs of Harvard has written: “. . . every specialty is better mastered, better understood in relation to human life and achievement, by the man who has worked hard in other subjects. I believe the ἔργον,* or job, is the better for the πάρ-ἔργον,* or side-job.” This would seem to express, perfectly, the value of some manifestations of versatility—in a word, hobbies. In writing of my own, I cannot but be autobiographical. My own specialty—job—great hobby—has been school-mastering. For forty-four years, I had a certain amount of responsibility for the lives of a great many young people, and not a few who were not so young. The load, taken seriously, was not light. Some people can find escape in games. It was not so with me. I could go right through an active game of tennis, still painfully conscious of the troubles of some boy, parent or master. But once start working with my hands, and I was in another world. Not only have the various side interests relaxed the tensions of responsibility; they have also brought many points of contact with kindred spirits, young and old, in various fields and in various walks of life.

My varied interests have included stamp-collecting, the study of music, radio construction, cabinet-making, amateur botanizing, color photography, fishing, and, of all things, baking. This may make me appear a jack-of-all-trades, and master of none. Perhaps I am. Who ever mastered anything, anyway? The true hobbyist cannot but be a frustrated perfectionist. He wants to do things so well, and simply cannot catch up with perfection. Perhaps Browning was right when he wrote, “Ah, but a man's reach must exceed his grasp, or what's a Heaven for?”.

However that may be, I am going to write, briefly, of my own—one man's experiences and adventures with hobbies, for what it may be worth to other hobbyists.

JOHN DEQ. BRIGGS

*A chaplain, friend of ours, once defined philosophy as a midnight search in an unlit room for a black cat; and theology as a midnight search in an unlit room for a black cat that wasn't there.

(*In English type, “ergon and par-ergon”)

The next editorial by Mr. Briggs will tell of his stamp collecting hobby.

CALENDAR HISTORY

As the clock ticks off the minutes and hours, so the calendar will record the days and months with unfailing regularity until the end of time.

A day rarely passes that we do not glance at this infallible recorder that hangs on the wall or sits on our desk. We accept the calendar without question. We never mistrust its accuracy or reliability.

But research men for an advertising specialties firm which produces the bulk of the world's calendars, know the calendar that regulates our lives from birth to death was not always the obedient servant it is today.

Behind the calendar that hangs on the wall or sits on the desk lie centuries of research, confusion, adventure and romance all occasioned by man's countless attempts to nail down time to an accurate schedule of measurement.

Since the first cave man whacked at a handy tree with his stone axe to mark passage of one day, man has tried many ways to keep track of time accurately. But even in these prehistoric days, man dimly realized that the movement of heavenly bodies was the basis of timekeeping.

Astronomy, before men had identified it, was and is the thing on which all calendars rest. When the earth turns on its axis, it furnishes one unit of time—the day.

The revolution of the earth around the sun makes the year. The passage of the moon around the earth gives us the third unit—the month.

The problem of calendar making through the centuries has been to reconcile these three units of measurement. All of man's efforts have been directed at equalizing units so that by the end of the year, nature and man's measurement of time would come out even.

To keep track of nature's goings-on may sound simple. However, to measure these journeys of celestial bodies in the matter of minutes, even seconds, is a job for trained astronomers and other scientists.

Spring, we say, begins on the 21st of March. But this is just rough approximation. Just what second during that day—or the day before or after—does the vernal equinox make its visit?

A few minutes or hours doesn't sound like much in computing a year but even minutes can

pile up. After centuries, this mountain of minutes can cause extreme difficulties.

JOSEPH H. SUMMERS
Brown & Bigelow

ALCOHOLISM IN INDUSTRY

Although alcoholism is receiving increased recognition as a health problem, there is still a tendency to believe that it happens only to someone else. This attitude also prevails in industry where the feeling often is expressed that, "Alcoholism is a serious problem—but not for us. We don't have any alcoholics." It has been reliably estimated, however, that at least 3 per cent of the average industrial work force will be alcoholics and that these employees will be found at all levels, from top management on down. This contradiction between belief and fact results from the hidden nature of the problem. Until its last stages, alcoholism shows no obvious signs. The alcoholic does his best to conceal his condition. He is often given very able assistance by the wife who makes excuses for his absences; by the fellow workers who do his work for him; by the supervisor who covers up for him, because he doesn't want to see him lose his job, or by the family physician whose medical terminology may hide the real problem.

An industry that is not sure it has an alcoholism problem might do well to analyze its attendance records, particularly those for Mondays and days following holidays. When an employe has a pattern of absences of this kind, it might be well to check further on his accident rate, over-all efficiency, and morale. In many cases, the results of such an analysis will reveal alcoholism as the basic problem.

When an industry starts investigating its alcoholism problem, it is likely to find that the average alcoholic employe will be a man, married and between the ages of thirty-five and fifty, who has been with the company for more than twenty years. The company will probably find that this man has had a good work record and is still a good worker . . . when he is on the job. Many alcoholics are highly skilled and, under ordinary circumstances, would be ready for key positions in the industry. It is obvious that industry cannot afford to lose such employes.

Second in a series of editorials on alcoholism in industry.

First of a series of seven editorials on calendar history.

Fortunately, more and more industries are taking steps to find out how much of an alcoholism problem they have and what they can do to rehabilitate the alcoholic employee. This interest is an outgrowth of industry's increased concern for employee welfare. However, it is also based on economic facts. With the acute shortage of trained workers in practically all fields today and with the high costs of training new employees, it is more important than ever for industry to take a close look at its policies regarding the alcoholic employee.

When the existence of alcoholism is recognized, rehabilitation is the next step. Industrial alcoholism rehabilitation programs have been conducted in a variety of ways. Some have depended solely on Alcoholics Anonymous; others have made effective use of community agencies; and still others have established programs of their own, utilizing AA counseling and company or community social services. Several large eastern concerns have found it profitable and effective to contribute toward the support of an alcoholism clinic to which their employees may be referred. It is extremely important, whatever type of program is conducted, that it have the sanction and support of top management. Without this, the program has little possibility of success.

PATRICK BUTLER, *Chairman
Minnesota Advisory Board
on Problems of Alcoholism*

RESPONSIBILITIES OF THE MEDICAL PROFESSION IN THE USE OF X-RAYS AND OTHER IONIZING RADIATION

1. The United Nations General Assembly, being aware of the problems in public health that are created by the development of atomic energy, established a Scientific Committee on the Effects of Atomic Radiation. This Committee has considered that one of its most urgent tasks was to collect as much information as possible on the amount of radiation to which man is exposed today, and on the effects of this radiation. Since it has become evident that radiation due to diagnostic radiology and to radio-therapy constitutes a substantial proportion of the total radiation received by the human race, the Committee

considers it desirable to draw attention to information that has been obtained on this subject.

2. Modern medicine has contributed to the control of many diseases and has substantially prolonged the span of human life. These results have depended in part on the use of radiation in the detection, diagnosis and treatment of disease. There are, however, few examples of scientific progress that are not attended by some disadvantages, however slight. It is desirable therefore to review objectively the possible present or future consequences of increased irradiation of populations which result from these medical applications of radiation.

3. It is now accepted that the irradiation of human beings, and particularly of their germinal tissues, has certain undesirable effects. While many of the somatic effects of radiation may be reversible, germinal irradiation normally has an irreversible and therefore cumulative effect. Any irradiation of the germinal tissues, however slight, thus involves genetic damage which may be small but is nevertheless real. For somatic effects there may however be thresholds for any irreversible effects, although if so these thresholds may well be low.

4. The information so far available indicates that the human race is subjected to natural radiation,[†] as well as to artificial radiation due to its medical applications, to atomic industry and its effluents and to the radioactive fall-out from nuclear explosions. The Committee is aware of the potential hazards that such radiation involves, and it is collecting and examining information on these subjects.

5. The amount of radiation received by the population for medical purposes is now, in certain countries, the main source of artificial radiation and is probably about equal to that from all natural sources. Moreover, since it is given on medical advice, the medical profession exercises responsibility in its use.

6. The Committee appreciates fully the im-

Statement by the United Nations Scientific Committee on the Effects of Atomic Radiation.

[†]The radiation due to natural sources has been estimated to cause between 70 and 170 millirem of irradiation to the gonads per annum in most parts of certain countries in which it has been studied, although higher values are found locally in some areas. See the reports "The hazards to man of nuclear and allied radiations" published by the United Kingdom Medical Research Council in June, 1956, in which also the millirem is defined; and from information submitted to the Committee.

portance and value of the correct medical use of radiation, both in the diagnosis of a large number of conditions, in the treatment of many such diseases as cancer, in the early mass detection of conditions such as pulmonary tuberculosis, and in the extension of medical knowledge.

7. Moreover, it appreciates fully the contribution of the radiological profession, through the International Commission on Radiological Protection* in recommending maximum permissible levels of irradiation. As regards those whose occupation exposes them to radiation, the establishment of these levels depends on the view that there are doses which, according to present knowledge, do not cause any appreciable body injury in the irradiated individual; and also on the consideration that the number of people concerned is sufficiently small for the genetic repercussions upon the population as a whole to be slight. Whenever exposure of the whole population is involved, however, it is considered prudent to limit the dose of radiation received by germinal tissue from all artificial sources to an amount of the order of that received from the natural background radiation.

8. It appears most important therefore that medical irradiations of any form should be restricted to those which are of value and importance, either in investigation or in treatment, so that the irradiation of the population may be minimized without any impairment of the efficient medical use of radiation.

9. The Committee is consequently anxious to receive information through appropriate governmental channels as to the methods and the extent by which such economy in the medical use of radiation can be achieved, both by avoiding examinations which are not clearly indicated and by decreasing the exposure to radiation during examinations, particularly if the gonads, or the foetus during pregnancy lie in the direct beam of radiation. It seeks, in particular, to obtain information as to the reduction in radiation of the population which might be achieved by improvements in instrument design, by fuller training of personnel, by local shielding of the gonads, by

choosing appropriately between radiography and fluoroscopy, and by better administrative arrangements to avoid any unnecessary repetition of identical examinations.

10. The Committee also seeks the co-operation of the medical profession to make possible an estimate of the total radiation received by the germinal tissue of the population before and during the child-bearing age. It considers it to be essential that standardized methods of measurement, of types at present available, should be widely used to obtain this information, and it emphasizes the value of adequate records, maintained by those using radiation medically, by the dental profession, and by the responsible organizations in allowing such radiation exposure to be evaluated. The Committee is convinced that information of this type will make it possible to decrease the total medical irradiation of the population while preserving and increasing the true value of the medical uses of radiation.

LETTER TO A YOUNG DOCTOR

My dear young Hippocrates,

I am addressing you in this way to remind you that you are *not* a creation of the 1948 National Health Service. You were born in the Aegean in the fifth century before Christ, and because of this it seems almost unnecessary for me to talk to you, for you already know from your student days that the precepts that govern your behaviour as a doctor have their origins in the mists of time. All the same, they are as strong today as throughout the ages. Since the beginning, our first duty has been towards our patients, to be at the same time their servants and their trusted friends. No National Health Service, no government by rules and regulations, no employment by the state, must ever be allowed to interfere with this traditional relationship: your job is to be a doctor first and a government servant afterwards.

I am, as you know, a family doctor. Forgive me, therefore if I say how much I hope you will enter this sphere of medical practice. Don't be put off by the term "general practitioner." Many of us dislike it. We prefer to be thought of and talked about as family doctors.

What type of man is this family doctor? I'm afraid you won't have heard much about him

*See the report of the International Commission on Radiological Protection (published in the *British Journal of Radiology*—Supp. 6, of December, 1954—in the *Journal français d'électro-radiologie*—No. 10, of October, 1955—etc. and revised in 1956).

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in your teaching hospital, for only the most advanced have yet got down to training their students particularly for general practice. Obviously this is a disadvantage. I well remember when I first left the security of my ancient hospital (in which I had been protected by the ward sister, bless her, the registrar, the assistant, and the senior physician) and found myself *alone* in general practice. I was armed with a book of my hospital's favourite prescriptions, and some hasty notes as to which should be used for what diseases. I also had that knowledge of human nature usually to be gleaned from six years of undergraduate existence, and the idea that because I'd satisfied my examiners I could also satisfy my patients.

To such a man are thousands of individuals entrusting themselves every day, and both patient and doctor are inwardly most apprehensive: the patient less so than the doctor, for he at least may have learnt what is wrong with him from his previous medical advisor, and have a fair knowledge of the treatment he should be given. It is not beyond the bounds of possibility that he'll clasp the new doctor to his bosom, taking on a sort of "I-saw-him-first" attitude, and telling his friends that the new young doctor is all right and knows his stuff. He must be relied upon to do this. It is the only hope. Cast yourself at first upon your patient's mercy; never pretend to know more about his illness than he does. A well-trained patient will sum you up in a few minutes, and your future bread and butter will depend a great deal upon his judgment.

If you do this, your favourite book of prescriptions won't matter. New vistas will be opened up and, for the first time, you will see the full depth of the medical stage. You'll realise that throughout your life you will be expected to play the leading part, and that your performance will be critically watched by a large audience who will insist that you should be word and action perfect on every occasion. It doesn't take long to convert a newly qualified and comparatively ignorant doctor into a knowledgeable and efficient family physician, wise beyond his years. He soon becomes capable of dealing with any type of patient, any emergency and any unpredictable situation, but the uncertainty and the excitement never go. Each day is a new adventure, each patient a new problem, each birth a new triumph, and each death a new heartbreak.

Let me now add a word of warning. The man who goes into family doctoring and reckons he is going to make a success of it merely because he knows a text-book of medicine off by heart, or how to give a blood transfusion, is going to flop as from the first day of his arrival in practice. The qualities which go to make a good doctor do not appear in any text-books; they are not discussed in any university medical curriculum, nor are they in any book of prescriptions. I divide them into two groups.

Compassion and Understanding

The first is compassion, sympathy, and understanding. The ability to feel for and to be as one with the patient in his illness, and to get across to him that, once having consulted you, he is no longer alone in his struggle. This is the foundation on which all medical treatment is built. It is, one might say, the container into which the medicine is poured and from which it is taken. An atmosphere of indifference, a cross look, an unsympathetic word, a quick glance at the clock, a prescription written before the full story has been told, a failure to examine thoroughly, and the container is cracked and worthless, and nothing that is put into it will do the patient any good.

As the years go by, you will be introduced to more and more human problems. Tolerance grows and compassion is intensified. The words left unspoken in the history, conveyed, as it were, by the worried look, begging you to understand that more could be said if it did not entail possible disloyalty to a husband, wife, or child, lack of appreciation of the mother-in-law living on the premises, inability to cope with the housekeeping, and so on; the little human displays that have to be put up, the fences to hide poverty or unhappiness from neighbours; the deaths and separations in the family; all mixed with the happy things, such as births and weddings and younger-generation achievements. All these appear in the surgery sooner or later, wrapped up in some obscure form or another. The majority of them are crying out for compassion, sympathy, and understanding.

Often, treatment can stop after a display of one or more of these qualities, but more often one must look for ingredients to put into the containers, and here we come to our second group:

the all-important non-material agents, faith and hope. I am not mocking, as I'm sure you will realize, when I say you must explain to a patient why you are giving him a certain medicine. Over and over again I have noticed that a patient with more than one complaint will come back after a week or so with the wrong one cured unless a careful explanation is given to him at the beginning as to which one is being treated.

The specialist does not depend so much for his success on these agents; he relies more on the build-up you give him. You know the sort of thing: "You'll find him a bit abrupt, Mrs. Jones, but don't worry about that. He's incredibly clever, and he knows your sort of case inside out." Mrs. Jones carries with her to the hospital your sympathy and understanding, together with the faith and hope you have given her. She is delighted to share your confidence in this particular consultant, and she would positively *hate* him not to be abrupt. His very abruptness becomes part of the treatment she expects from him. In all this you'll be in difficulties when you first start practising. But you will get to know your patients quite soon—particularly if you make a point of delivering their babies, piloting the children through the infectious diseases, and the parents through all the crises which occur when two or three human beings are gathered together.

This brings us to the sort of work you may expect to do in general practice, and the first thing I would say to you in this connection is that you must not think that because you are a family doctor you are to work on a lower plane than your colleagues in hospitals, or in local-authority health departments.

You do not often need to shift the responsibility for the care of your patient away from yourself from the first stage of his illness to the last. You have medical officers of health at your disposal, together with radiologists, pathologists, and specialists of all sorts, all of whom will willingly attend a consultation with you in your patient's home. In addition, you have midwives and health visitors, and one particularly important member of the team 'round the patient's bed—the parish priest or his nonconformist colleague.

But remember that when you visit your patient and decide to look after him yourself, you will be seeing him only for ten minutes each day, yet he is going to be ill for the whole twenty-four

hours. In other words, do not just leave him with a prescription and a few words of sympathy. Arrange for the district nurse to call. Ask him if he wants a home help. In fact fix it so that the patient is able to recover from his illness without his family collapsing.

I could talk to you for hours about the various types of patients you will see. Let me mention only three groups. The first are those who will come to you and say, "Of course, doctor, I know this is due to my age." Woe to you if you ever agree! It is your job to keep your patients as fit and active as possible, in spite of their age. They may be getting breathless when they walk upstairs, or have pain in their calf muscles when they go out shopping; they may find it difficult to get their knees moving in the mornings, or their insides moving at all. Whatever their trouble is, make sure that they clearly understand that it is not owing to their age. If it is, it may well be your fault and not theirs. They should have been moved into a flat long ago; the physical medicine department should be attacking their muscles and joints, and the daily living department their homes; they should be busy losing a stone in weight, and the home-help service should be at hand to help with the cooking, the cleaning, and the shopping. (Only two days ago, for example, a patient told me she had taken her rheumatism to Dr. X and he had told her there was nothing more he could do about it. Both she and I were flabbergasted. From a family doctor such a remark is little short of heresy.)

Next there are the neurotics, who will take up so much of your time and who tend to give general practice a bad name. Yet they are so often charming people, sensitive, generous, perhaps over self-centred, solitary children, spoilt and coddled in past years when such extravagances were possible; unrealistic, maladjusted, and quite incapable of standing up to the rush and tear of modern life. Their greatest sin is that they take up too much of your time. But that is no excuse for an unsympathetic or irritable manner. Always try to have a few minutes to spare each day for the lonely person who just wants to be talked to, to be advised or—quite often—instructed. A dismissal after ten minutes of chatting is far more effective than a hurried prescription after two minutes of reproach. And remember that the neurotics will be either your best advertisement

or your worst. Willy-nilly they constitute the group of patients who talk the most. It is nice to arrange that they say the right things!

Finally, a number of patients will complain of a symptom or group of symptoms recognizable at once as resulting from chronic stress and strain. You will see several of these every day. For all of them you are expected to supply a remedy in the shape of a bottle of medicine or a box of tablets, while the stress and strain goes on. How can one put a rest, or a holiday with change of environment, into a bottle or a box? Yet it has to be done, for nearly all these patients are women. They are bearing the burden of the home, the meals, the children, and (in far too many cases) of earning an addition to the family income to pay for that little extra of housekeeping, or the instalments on the furniture, the television, or the car. If you tell a male patient to go to bed he will thankfully retire, but say the same things to his wife and she'll need at least a week's notice, and if you try to keep her in bed for too long, you will find that she has timed your next visit to a nicety, so that she is in bed for a maximum of two minutes before you arrive and thirty seconds after the car has driven away. (You have only to be a family doctor for a week or so to realise of what poor stuff we males are made!)

A Perpetual Student

Before I leave you, let me say two more things, very briefly. The first is that as a doctor you must think of yourself as a perpetual student. It is unfortunate that nowadays, because of money, you may be tempted to take on too many patients, and this is bound to cut down the time you have to spare for reading, research, attendances at post-graduate courses or on hospital ward rounds. Yet if you are to do justice to your patients, you must take every possible chance to learn more and to keep your knowledge up to date. And never forget that whether you are a family doctor, a hospital consultant, or a medical officer of health, you are at the same time a member of one great and noble profession, artificially divided into three parts by the health service, but essentially one if the treatment of the patient is to be 100 per cent successful.

As a doctor, you may grumble and be full of pious misery in the winter months, but you will

never be so happy as when full of self-pity, never so contented as when overworked, and never so miserable as when away from your patients and the all-absorbing drudgery of medicine.

RONALD GIBSON
General Practitioner

REHABILITATION IN PULMONARY TUBERCULOSIS

Settlement

There have been great changes in treatment and in Social Medicine since Varrier Jones set out to provide for the housing and work of the patient whose prognosis made the sanatorium only a half-way house to further breakdown. Although settlement is not, and never was, the whole answer, it is still the only one for a significant proportion of sufferers; for example, some 10 per cent of all admissions have colonized at Papworth in the past seven years. They have done so of their own choice, after showing by their treatment and training their ability to earn their living in continuing sheltered employment.

By arrangement with the Trades Unions, they are paid at a rate only two-pence per hour under the full rate for a master-workman in open industry; one half-penny per hour is added every year for the next four years. The married men are given houses in rotation as our finances permit. As these houses are at low rentals, and there is no expense in commuting, there is sufficient money available for the proper care of the family, for whom, under the terms of our Charter, work is found in our shops. The boys can do their full apprenticeship in any of our trades, and so fit themselves for outside employment. Every colonist can join a voluntary superannuation scheme in which his contribution is doubled by the management; he can therefore make provision for his retirement over and above the normal, statutory old-age pension, or for a lump sum to be paid to his wife should he pre-decease her.

These settlers are the real back-bone of the economy of Papworth. They are an encouraging example to the man who commences training with a feeling of insecurity. All money made from the sale of their products comes back to the village in wages, housing, machines and amenities; the Management Committee are unpaid directors. The families provide the necessary fit personnel

(Continued on Page 344)

President's Letter

SOME FUNCTIONS OF THE STATE BOARD OF MEDICAL EXAMINERS

The Minnesota State Board of Medical Examiners has performed yeoman's service for the citizens of our state and for the science of medicine.

The board consists of seven physicians appointed by the Governor of Minnesota for seven-year terms, one term expiring each year, and it has as one of its duties the granting of licenses to practice medicine. It also has the obligation of seeing that physicians, once licensed, do not engage in "immoral, dishonorable or unprofessional conduct," as defined by the statutes of Minnesota, and that they respect and observe these statutes which are enacted by the Legislature of the State of Minnesota to govern the actions and conduct of physicians in this state.

For most physicians, these matters are no problem and cause no concern. When infractions of law and of ethical and moral conduct do occur and are brought to the attention of the State Board of Medical Examiners, the physicians involved are brought before the Board and are accorded a fair hearing. Investigations are made by the legal counsel of the Board and his associates who inquire into any and all reports of the misconduct of any physician. The results are laid before the Board for consideration. Thorough deliberation follows and, as a result, the physician may be absolved of the charges or reprimanded or suffer suspension or revocation of his license. The Board receives many complaints which, after thorough investigation, are found to be only imaginary grievances, and are disposed of by a thorough airing and open discussion with the person accused. Fortunately, real infractions of conduct are rare in the medical profession.

These activities represent but a few of the problems which come before the State Board of Medical Examiners. However, they are of prime importance.

The licensing of foreign-trained physicians has been one of the most difficult problems to confront the Minnesota State Board of Medical Examiners. Similar boards of other states have been challenged by this problem for many years. With the advent of World War II, it became an impossibility to validate the credentials and personal references of candidates for licensure from many foreign schools. Fraudulent diplomas from foreign countries have come to light in the United States, thus additionally complicating the situation.

On November 12, 1937, the Minnesota State Board of Medical Examiners adopted a resolution by which only graduates of Class A schools from Canada and the United States were admitted to practice in Minnesota. All these schools in the United States are subject to inspection by proper authorities of the American Medical Association. During World War II, many universities of Europe were devastated, and have not been restored in their entirety to this date. Medical education in Europe in general has not been comparable to that of the students in American schools. For instance, in 1947 there were 3,500 medical students at the University of Vienna, out of a total enrollment of 7,000. At the University of

Munich there were 4,000 registered in the medical school, with a waiting list of 3,000. It was common for American students who had failed in the United States to enroll in European schools without having to repeat the course in which they had failed.

After World War II, the United States was faced with the problem of relocating displaced persons. Many of them were physicians from various European countries. Under the Displaced Persons Act of 1948, more than 200,000 aliens came to the United States. In 1953, a second act was passed which was designed to admit another 209,000 nonquota refugees before December 31, 1956. Hence, in view of these statutes and the resolution which the Board adopted in 1937, as mentioned earlier, a conference on the advisability of licensing foreign physicians by the Minnesota State Board of Medical Examiners was held with Governor Youngdahl in January, 1949.

It has become extremely difficult under these conditions to evaluate foreign medical schools. Hence, the Minnesota State Board of Medical Examiners developed rules and regulations for the examination of applicants for licensure who came from schools outside the United States or Canada. In addition to requiring the applicant to meet the requirements of certain well-founded rules and regulations, the Board now interviews each foreign physician, and his problem is considered on an individual basis. At the time of his interview, he must present documentary evidence, properly authenticated, to prove that he has successfully completed a course equivalent to that given and required by the School of Medicine of the University of Minnesota, and that he has received the degree of bachelor or doctor of medicine or its equivalent. He must present evidence of good moral character, must be able to read, write and speak English, must possess evidence that he has successfully passed the examination of the Board of Examiners in the Basic Medical Sciences, and must have received a certificate of registration in the basic medical sciences. If the candidate can meet these requirements and can pass the Board's evaluation, then he is allowed to take a two-year internship in an accredited hospital in the State of Minnesota. Depending on his record as an intern, he may or may not be allowed to take the examination of the Minnesota State Board of Medical Examiners at the completion of his internship. These regulations have considerably improved the situation with respect to the licensure of foreign physicians. The number of applicants has diminished.

In view of the new influx of Hungarian displaced persons, it is possible that another wave of physicians seeking licensure in Minnesota will approach the Board, and that pressure will be brought from outside sources for the licensing of physicians without proper accreditation, as happened after World War II. However, on the basis of our experience in the past, we should be able to meet the situation in a more satisfactory manner than was possible some years ago.

Another closely related problem concerns postgraduate study on the part of physicians from other countries at the University of Minnesota and at the Mayo Foundation. We all agree that the process of training these physicians should be in the finest tradition of improving medical care for the mass of people throughout the world and that it should, at the same time, enhance friendly relations between the people of the United States and the people of other countries. Now,

this exchange of views also carries with it the implication that the Minnesota State Board of Medical Examiners ought to be better able than most other bodies or organizations in Minnesota to evaluate the type, extent and quality of medical education that has been obtained by physicians and surgeons in foreign countries. Hence, it would be reasonable to assume that the Minnesota State Board of Medical Examiners should assist in a fair and proper determination of approval or non-approval of the quality of medical education attainable in foreign schools. The Board has passed a resolution by which a limited number of foreign physicians and surgeons would be enrolled, for the sole purpose of graduate education in the University of Minnesota and in the Mayo Foundation at Rochester for a period of three consecutive years, or as otherwise determined. The primary purpose of such a course of study is to enable foreign physicians to further their graduate medical education and then to return to their native countries. This particular action is in no way intended to qualify these physicians for medical licensure in the State of Minnesota. If any of the physicians who have completed this special type of graduate study desire to apply for medical licensure in this state, their applications will be considered on an individual basis at the discretion of the Board, and the applicants must first comply with the regulations set forth by the Board.

An additional effort of the Board in this direction is the legislation recently introduced by the Board, and passed at the current session of the Legislature, to amend the Medical Practice Act so that temporary resident licenses can be granted to a limited number of residents in accredited hospitals in the State.

By January 1, 1957, 112 foreign-born physicians had been licensed by the Minnesota State Board of Medical Examiners. Of the 112 licensed, 50 have now become citizens of the United States.

The original purpose of this program of licensing foreign physicians was to improve the distribution of physicians in the State of Minnesota. It was the hope of the Board that these physicians would seek to practice medicine in the smaller communities, or in communities in which physicians are really needed. In practice, this desideratum has not come to pass.

It would seem, therefore, that only a small percentage of the foreign physicians licensed to practice medicine in Minnesota actually have established practices in the smaller communities of Minnesota. It is hoped that in the future this undesirable situation will be changed.



President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

NEW BILLS FILED IN CONGRESS MORE HEARINGS SCHEDULED

Hill-Burton Amendment

A new measure sponsored by Senators Lister Hill of Alabama and Robert S. Kerr of Oklahoma amends the Hill-Burton Act to allow the government to make low interest *loans* as well as *grants* in support of hospital construction.

Humphrey Plan Revived

Ever since he became a Senator eight years ago, Minnesota's Hubert Humphrey has tried for passage of a bill authorizing Federal loans, long-term and low-interest, to assist voluntary nonprofit associations offering prepaid health services. Just recently, he put it in again and promised to press for favorable action in this 85th Congress. Hearings will be conducted by the health legislation subcommittee of the Senate Labor Committee.

Delay Asked on Disability Amendment

At the request of the Department of HEW, ranking members of the House Ways and Means Committee are sponsoring a bill amending Title II of the Social Security Act. It would extend for one year the deadline for disabled workers to apply for determination of disability preliminary to "freezing" of their benefit rights. Under the existing law, the time limit is June 30, 1957, but HEW believes that a year's extension is imperative because an estimated 165,000 eligibles have yet to apply for disability determinations.

Hearings

Hearings have been opened by the aviation subcommittee of the Senate Commerce Committee on S. 1045 which gives medical affairs a status in the Civil Aeronautics Administration comparable to that which they hold in the military and in the Veterans Administration.

The printed transcript of Congressional hearings held in March on the Department of HEW's budget is almost an encyclopedia of government medicine. It sheds new light on the Administration's views on health insurance, and it contains

technical descriptions of research conducted at the 500-bed Clinical Center at suburban Bethesda, Maryland. In the 1,602 pages of its two volumes, the transcript presents testimony and committee-men's comments on medical school subsidization, the deterioration of U. S. Public Health Service hospitals, the health of American Indians and many more subjects.

HIGHLIGHTS OF HEW BUDGET REVIEWED

The HEW budget (combined with that of the Labor Department) was reshaped by a subcommittee whose chairman was Representative John E. Fogarty (D., R. I.).

Among the highlights of the HEW budget are these:

Medical Research Assistance

For support of medical research, the House Appropriations Committee has recommended what the Administration asked—\$220,183,000. Of this total, \$30 million is for research construction grants; the bulk of the remainder would go to medical schools and hospitals for project grants, with substantial sums marked for the operation of the Clinical Center and intramural research at the parent National Institutes of Health.

Public Health Service Hospitals

For the first time in years, the full sum requested (\$44,399,000) was granted because of the grim picture painted of the obsolescence and maintenance shortcomings of these hospitals.

Hill-Burton Hospitals

For continuation of Hill-Burton hospital expansion grants, \$120 million was approved. This was exactly what the Administration requested, although the House group did some fund shifting.

Health Care of Indians

The sum approved for the construction of health facilities for Indians was \$3,096,000, a reduction of \$2,704,000 from the request. This was

justified on the basis of the fact that nearly \$12 million in carryover funds is still available for the construction of hospitals and clinics.

Health Aid to States

Stricken from the HEW budget was a \$1.5 million item for special project grants to the states in the field of chronic disease and aging.

NEW DOCTOR-DRAFT PLAN DUE FOR HOUSE HEARING

The Administration's proposed substitute for the doctor-draft law which expires in June was sent up to Capitol Hill early in April and promptly introduced as a bill by Representative Carl Vinson (D., Ga.). It is expected that it would be passed by the House with little delay following hearings scheduled by the Armed Services Committee. The only change which this bill makes in the existing law is to eliminate the 4-ply priority system. The President retains authority to call up physicians and dentists as and when needed by the armed forces.

However, the bill does neglect to continue the medical advisory committee to selective service headed by Dr. Howard A. Rush since its beginning in 1950. The American Medical Association and the American Dental Association will doubtless urge its retention.

MINNESOTA INCLUDED IN AWARD FOR RESEARCH BUILDING

The Public Health Service has approved the awarding of thirty-five grants to twenty-seven institutions, chiefly universities, to aid in the construction or improvement of research facilities. Three of the recipients will get more than one-half of the total: the University of Minnesota, Bowman Gray School of Medicine, and the University of Oklahoma Medical Center. A few of the grants are for the purchase of equipment. These are on a dollar-for-dollar matching basis, the same as the construction subsidies.

SUPREME COURT DECLINES TO SUPPORT NATUROPATHY

The U. S. Supreme Court reviewed and affirmed a lower court's judgment against a naturopath and his sympathizers who contended that Maryland's Medical Practice Act is unconstitutional because it makes no provision for the licensing of healers who follow that cult. The Court

handed down no written opinion. Also, recently, the highest tribunal turned down a petition to review a Utah court decision supporting the right of the state's Attorney General to withdraw from naturopaths licensing privileges to practice obstetrics and perform minor surgery.

These were not the first cases involving naturopathy to be considered by the Supreme Court at the current session, and they will not be the last. Its practitioners and their associations are particularly busy this year in the nation's courts as well as in legislatures, making determined bids for recognition as a healing art.

MORE TALK OF SOCIAL SECURITY FOR PHYSICIANS

As a sideline on social security for the professions, HEW says that more than one-half of the country's clergymen have exercised their option to be covered. April 15 was the deadline for their applications for inclusion. Congress members and committees continue to receive letters and petitions from individual physicians and medical groups requesting social security benefits for M.D.'s.

The pros and cons of the major issues involved in the proposed coverage of physicians were set forth at the annual meeting of the Providence (R.I.) Medical Association by a research associate of the Life Insurance Association of America and an authority on the old age and survivors insurance program. The speaker concluded that "the cons just about balance the pros" yet he felt there "is a bit more to be said in favor of OASI coverage for doctors than against it." He based his premise mainly on the economic factor—that OASI can be considered a "good buy" with the participants, on the whole, getting their money's worth.

In reviewing this analysis, the *Rhode Island Medical Journal* editorializes that "the analysis . . . is excellent from an economist's point of view but not from a physician's.

" . . . The big question of principle and philosophy that still remains unanswered and probably can only be answered by the individual physician is this:" states the Journal. "If the physician believes the federal government should compel him and every other citizen to pay into a tax fund to provide benefits for his old-age insurance and retirement and protection for his survivors in the event of an early death, then does he not have

to agree to the logical corollary that the government would be justified in taxing him and everyone else to provide medical care for all under a compulsory system?

"Before he consents to join any compulsory social security system," the *Journal* continues, "the question which he should thoughtfully consider is this: 'Am I willing to exchange my personal economic liberty for promises of material welfare?' Should the medical profession decide to surrender one liberty, it will surely be invited or even compelled, later on, to surrender others."

BRITISH M.D.'S CONTINUE TO CONSIDER WALK-OUT

Twenty-thousand British physicians are still threatening to pull out and go back to private practice unless they get a 24 per cent increase in the fees the government pays them. This latest difficulty for the program that was set up by a Socialist government back in 1948 is bringing to the surface a whole series of complaints. Lack of incentive for the medical profession, poor relationship with patients and a decline in ethical standards are a few of the things being debated by critics and supporters of the National Health Service.

Under the present system, family physicians get a lump sum annually for each patient. A doctor with a maximum list of 3,500 patients has a gross income of \$8,600 per year. Specialists receive flat salaries ranging from \$5,000 to \$8,700. In addition, they can qualify for "distinction awards" that go as high as \$7,000 for "special contributions to medicine, exceptional ability or outstanding professional work."

What the patient gets is complete medical care and hospitalization. The only things a Briton has to pay directly for are 14 cents each for prescriptions, \$2.80 for a full course of dental treatment plus nominal sums for false teeth, eyeglasses and medical appliances.

For the government, the steadily rising cost of socialized medicine is causing great worry. Ever since the system was created, the bill has been going up. By 1950, it was \$1.2 billion a year. In the next budget, it will be around \$2 billion. Now the doctors who want a raise are forcing everyone to take a close look at socialized medicine after nearly ten years of trial.

What the examination shows is this: The program is more expensive than anyone expected.

There is a lot of grumbling among doctors about being underpaid, overworked and forced to neglect advances in their profession since they are encouraged to send unusual cases to specialists. Said a British Medical Association official: "General practitioners are becoming men who merely dole out pills and tranquilizers."

Now the M.D.'s say that if the government fails to satisfy their demand for a 24 per cent pay increase, they will make a "progressive withdrawal" from the Health Service. On October 2, GP's in "selected areas" will resign from their local medical lists. During October, former NHS patients will be treated free but starting November 1 patients will be charged a standard "token fee," probably about 70 cents for a consultation and about \$1.05 for a home visit. Later, as more GP's withdraw from the service, a "full economic charge" for the doctor's work will start.

STATISTICS ON OBSTETRICAL COSTS, HOSPITAL OCCUPANCY

Obstetrical Costs

A recent release from the Health Information Foundation comes as a welcome change from the usual reports of increasing medical costs. Having a baby is not only safer today than it was twenty-five years ago, but measured in equal dollars, it is also 18 per cent less expensive. Total obstetrical care during the 1928-1931 period averaged \$258 in terms of the present day dollar. In 1953, total obstetrical care averaged \$213. These figures are all the more significant considering the cost of all medical care when one realizes that seven per cent of hospital admissions in 1953 were obstetrical admissions.

According to the Foundation, Americans have consistently spent approximately the same proportions of their expendable incomes—4 to 5 per cent—for medical care each year for the past twenty-five years. Yet a much broader range of diagnostic and treatment facilities is now available to more people than ever before, for the same relative cost.

Hospitals

Occupancy of beds in eleven Minneapolis-area hospitals was "well above" the recommended rate in March. On an average day, 21,149 patients were occupying beds at the hospitals. This is 93 per cent occupancy, well above the 75 to 80 per

(Continued on Page A-36)

Meetings and Announcements

STATE

MINNESOTA STATE MEDICAL ASSOCIATION, 104th annual meeting, Saint Paul, May 13, 14 and 15, 1957.

Minnesota Society of Internal Medicine, spring meeting, May 25, at Red Wing.

NATIONAL

American Congress of Physical Medicine and Rehabilitation, thirty-fifth annual scientific and clinical session, Los Angeles, September 8-13, 1957.

American Goiter Association, Hotel Statler, New York, New York, May 28-30, 1957. John C. McClintock, M.D., Secretary, 149½ Washington Avenue, Albany 10, New York.

American Association of Rehabilitation Therapists; Association for Physical and Mental Rehabilitation; Association of Medical Directors and Co-ordinators, Chicago, July 7-12.

Canadian Pediatric Society, Winnipeg, Manitoba, June 12-15, 1957. (Held in conjunction with the scientific opening of the Winnipeg Children's Hospital and with the Northwestern Pediatric Society.)

The Children's Hospital of Philadelphia. Three short refresher courses. "Pediatric Advances for Pediatricians and General Practitioners," May 27-31, 1957. "Practical Pediatric Hematology," June 3-5, 1957. "Blood Group Incompatibilities and Erythroblastosis Fetalis," June 6-7, 1957. Irving J. Wolman, M.D., Children's Hospital of Philadelphia, 1740 Bainbridge Street, Philadelphia 46, Pennsylvania.

New York University Post-Graduate Medical School. Management of Chronic Kidney Diseases, June 24-25, Dr. Lawrence G. Wesson. Office of Associate Dean, New York University Post-Graduate Medical School, 550 First Avenue, New York 16, New York.

New York University Post-Graduate Medical School. Management of Hypertension, June 26-27, Dr. J. Marion Bryant. Office of Associate Dean, New York University Post-Graduate Medical School, 550 First Avenue, New York 16, New York.

Ninth Postgraduate Assembly in Endocrinology and Metabolism, Medical College of Georgia, October 21-25, 1957.

Symposium on Tuberculosis and Other Chronic Pulmonary Diseases, Saranac Lake, New York, July 8-12, 1957. Sponsored by the American Trudeau Society, Saranac Medical Society, Adirondack Counties Chapter of the New York State Academy of General Practice. Write P. O. Box 11, Saranac Lake, New York.

University of Pittsburgh School of Medicine, Department of Surgery, Section of Anesthesiology—Post-

graduate Symposium on the Basic Sciences Related to Anesthesiology, June 10-14, 1957. Write to Chairman of the Committee on Graduate Medical Education, University of Pittsburgh School of Medicine, 3941 O'Hara Street, Pittsburgh 13, Pennsylvania.

INTERNATIONAL

Canadian Medical Association, Edmonton, Alberta, Canada, June 17-21. Dr. A. D. Kelly, 150 St. George Street, Toronto 5, Ontario, Canada.

Congress of International Association for Study of the Bronchi, Lisbon, Portugal, May 25-26. Prof. F. Lopo de Varvalho, 138 rua de Junqueira, Lisbon, Portugal.

Congress of International Society for Cell Biology, St. Andrews, Fife, Scotland, August 28-September 3. Prof. H. G. Callan, Bell Pettigrew Museum, The University, St. Andrews, Fife, Scotland.

Congress of International Society of Orthopedic Surgery and Traumatology, Barcelona, Spain, September 16-21. International Society of Orthopedic Surgery and Traumatology, 34 rue Montoyer, Brussels, Belgium.

Congress of International Society of Surgery, Mexico City, Mexico, October 27-November 2. Dr. L. Dejardin, 141 rue Belliard, Brussels, Belgium.

Fourth International Poliomyelitis Conference, Geneva, Switzerland, July 8-12. Registration deadline, April 1. Fourth International Poliomyelitis Conference, Secretariat, Hotel du Rhone, Geneva, Switzerland.

Inter-American Congress of Pan American Medical Association, Mexico City, Mexico, November 18-22. Dr. Joseph J. Eller, 745 Fifth Avenue, New York 22, New York.

International Congress of Clinical Pathology, Brussels, Belgium, July 15-20. Prof. M. Welsch, Universite de Liege, 32 Blvd. de la Constitution, Liege, Belgium.

International Congress of Dermatology, Stockholm, Sweden, July 31-August 6. Dr. C. H. Floden, Karolinska, Sjukhuset, Hudkliniken, Stockholm 60, Sweden.

International Congress of Electroencephalography and Clinical Neurophysiology, Brussels, Belgium, July 21-28. Dr. R. G. Bickford, Mayo Clinic, Rochester, Minnesota.

International Congress on Medicine and Surgery, Turin, Italy, June 1-9. Secretariat, Minerva Medica, Corso Bramante 83-85, Turin, Italy.

International Congress of Neurological Sciences, Brussels, Belgium, July 21-28. Dr. Pearce Bailey, National Institutes of Health, Bethesda 14, Maryland.

International Congress of Neurosurgery, Brussels, Belgium, July 21-28. Dr. William B. Scoville, 85 Jefferson Street, Hartford, Connecticut.

International Congress of Neuropathology, Brussels, Belgium, July 21-28. Dr. Ludo J. Bogaert, 47 rue de l'Harmonie, Antwerp, Belgium.

International Congress of Nutrition, Paris, France, July 24-29. Congress International de Nutrition, 71 Blvd. Pereire, Paris 17e, France.

International Congress on Rheumatic Diseases, Toronto, Ontario, Canada, June 23-28. International Congress on Rheumatic Diseases, P.O. Box 237, Terminal "A," Toronto, Ontario.

International Gerontological Congress, Merano-Bolzano, Italy, July 14-19. Segreteria, Quarto Congresso Internazionale de Gerontologia, Viale Morgagni, 85, Firenze, Italy.

International League Against Epilepsy, Brussels, Belgium, July 21-28. Dr. Radermecker, Institut Bunge, 59 rue Philippe Milliot, Berchem, Antwerp, Belgium.

International Symposium on Medical-Social Aspects of Senile Nervous Diseases, Venice, Italy, July 20-21. Secretariate, Viale Morgagni 85, Firenze, Italy.

Neuroradiologic Symposium, Brussels, Belgium, July 21-28. Professor Melot, Hôpital Universitaire St. Pierre, Brussels, Belgium.

Pan-Pacific Surgical Association, seventh congress, Honolulu, Hawaii, November 14-22, 1957. Write Dr. F. J. Pinkerton, director-general of the Pan-Pacific Surgical Association, Room 230, Young Building, Honolulu, Hawaii.

Third International Medical-Surgical Meeting, Torino, Italy, June 1-9, 1957. Includes four international congresses (International Congress on Nuclear Medicine, International Congress on Photobiology, and International Congress on the Problems of the Goitre), seven national congresses (on chemotherapy, gastroenterology, surgery), ten symposia (European Society of Cardiovascular Surgery, Symposium on Artificial Heart-Lung Machines), and many meetings on the various medical and surgical specialties. Write: Secretary-General, Minerva Medica, Corso Bramante 83-85, Torino, Italy.

William Harvey Tercentenary Congress, Royal College of Surgeons, London, England, June 3-7, 1957. Dr. D. Geraint James, Harveian Society of London, 11 Chandos Street, Cavendish Square, London W. 1, England.

AMERICAN COLLEGE OF PHYSICIANS TO HOLD POSTGRADUATE COURSES

Forthcoming postgraduate courses to be held by The American College of Physicians are as follows:

Internal Medicine—May 13-17, 1957, University of Chicago, Department of Medicine, Chicago, Illinois. *Meeting Place:* Albert Merritt Billings Hospital, 950 East 59th Street, Chicago 37, Illinois, Room P-117.

Early Prevention and Detection of Disease—May 20-24, 1957, University of Pennsylvania School of Medicine, Department of Public Health and Preventive Medicine, Philadelphia, Pennsylvania. *Meeting Place:* Auditorium, American College of Physicians, 4200 Pine Street, Philadelphia.

Internal Medicine—May 20-24, 1957, Louisiana State University School of Medicine, Postgraduate Division, Shreveport, Louisiana. *Meeting Place:* Confederate Memorial Hospital.

Cardiology—May 27-31, 1957, The National Institute of Cardiology of Mexico, Mexico, D. F. *Meeting Place:* The National Institute of Cardiology, Lecture Room "A."

Internal Medicine—May 27-31, 1957, New York University Post-Graduate Medical School, New York, New York. *Meeting Place:* Medical Science Building, New York University-Bellevue Medical Center, 550 First Avenue, New York.

Ballistocardiography—June 10-12, 1957. *Meeting Place:* Hospital of the University of Pennsylvania, Philadelphia, Pennsylvania.

LECTURE ON HEMOPHILIA

The Minnesota Chapter of the National Hemophilia Foundation will present a lecture by Dr. Kenneth M. Brinkhous, Professor of Pathology, University of North Carolina, on the subject of "Hemophilia," on Friday, May 24, 1957, at 8:00 p.m. in the Mayo Memorial Auditorium of the University of Minnesota. The University of Minnesota Medical School is co-sponsoring this event to which all medical personnel are invited.

CONTINUATION COURSES

Medical continuation courses to be presented at the Center for Continuation Study, University of Minnesota, include the following:

- May 6 -10 Introduction to Electrocardiography for General Physicians
- May 13-17 Proctology for General Physicians
- May 23-25 Surgery for Surgeons

For further information concerning the above courses, write to the Director, Department of Continuation Medical Education, 1342 Mayo Memorial, University of Minnesota, Minneapolis 14.

MAY RADIO SCHEDULE "DOCTOR, TELL ME"

Station	City	Day	Hour
KATE.....	Albert Lea.....	Wednesday....	7:00 p.m.
KXRA.....	Alexandria.....	Thursday.....	7:00 p.m.
KBUN.....	Bemidji.....	Sunday	8:15 p.m.
KLIZ.....	Brainerd.....	Saturday	3:45 p.m.
KROX.....	Crookston.....	Saturday	9:30 a.m.
KDLM.....	Detroit Lakes.....	Sunday	4:15 p.m.
KDAL.....	Duluth.....	Sunday	9:05 p.m.
KOZY.....	Grand Rapids.....	Saturday	6:30 p.m.
KYSM.....	Mankato.....	Friday	9:45 p.m.
KMHL.....	Marshall.....	Sunday	5:00 p.m.
KUOM.....	Minneapolis-St. Paul.....	Monday	11:15 a.m.
KCUE.....	Red Wing.....	Sunday	7:15 p.m.
KROC.....	Rochester.....	Sunday	10:15 a.m.
KFAM.....	St. Cloud.....	Saturday	9:30 a.m.
WAVM.....	Stillwater.....	Sunday	4:30 p.m.
KWLM.....	Willmar.....	Sunday	5:30 p.m.
KWNO.....	Winona.....	Wednesday....	7:00 p.m.
KWOA.....	Worthington.....	Sunday	4:30 p.m.

Woman's Auxiliary

NATIONAL CONVENTION

Announcement has been received of the program of the Woman's Auxiliary to the American Medical Association at its thirty-fourth annual meeting to be held in New York City, June 3 to 7. Headquarters for the Auxiliary's meeting will be the Hotel Roosevelt, Madison Avenue and 45th Street, within walking distance of the Waldorf-Astoria Hotel, where the AMA's House of Delegates meets, and close to shopping centers and theaters.

The general meeting will be held on Tuesday, Wednesday, and Thursday, June 4 to 6. On Monday, June 3, and Wednesday afternoon, June 5, round table discussions of interest and educational value to all physicians' wives will be held. A post-convention workshop for state presidents, presidents-elect and national committee chairmen will be held on Friday, June 7.

Social activities include a tea on Monday, June 3; luncheon on June 4 at which Dr. Howard Rusk, director of the Institute of Physical Medicine and Rehabilitation of the New York University-Bellevue Medical Center, will be the guest speaker; luncheon, Wednesday, June 5, at which the guest speaker will be Dr. Dwight H. Murray, president of the American Medical Association; and the annual dinner for auxiliary members, husbands and guests, Thursday, June 6, at which the guest speaker will be Professor Allen Richard Foley of Dartmouth College.

NEWS FROM THE COUNTY AUXILIARIES

Goodhue

The Woman's Auxiliary to the Goodhue County Medical Society recently voted to be an active organization again. Mrs. Royal Sherman, Red Wing, is press and publicity, newsletter and MINNESOTA MEDICINE chairman. The group has published a most attractive program for the year, entitled "The Minnesota Gopher Doctor's Wife." The cover was done by a former patient at Mineral Springs Sanatorium in Cannon Falls and the contents were produced by a handicapped lady from near Zumbrota.

Officers for 1957 are Mrs. Ezra V. Bridge, president; Mrs. George Hawley, vice president, and Mrs. John Falls, secretary-treasurer.

Mrs. James Halvorson and Mrs. Marland Williams are on the program committee for 1957; Mrs. William Liffbrig and Mrs. Edward Juers for 1958. Mrs. Winston Miller is in charge of membership and legislation and Mrs. James Brusegard, Mrs. Samuel Hamilton and Mrs. Clarence Wasmund make up the social committee. Other committees include: ways and means, Mrs. Raymond Hedin, chairman, Mrs. Oliver Larson and Mrs. Willard Akins; cancer, Mrs. Grant Hartnagel; mental health, Mrs. Oliver Larson; mentally-retarded children, Mrs. Leon Steffens; allied medical careers, Mrs. James Halvorson; medical and surgical relief, Mrs. William Walter; program and health education, Mrs.

Robert Molenaar; public relations and health days, Mrs. Edward Juers; *Today's Health*, Mrs. Clarence Wasmund; AMEF, Mrs. Samuel Hamilton; civil defense, Mrs. George Kimmel; tuberculosis, Mrs. Ezra V. Bridge.

Programs for the year include these: in January, the group met at the St. James Hotel in Red Wing. Guest speaker was Allan Stone, executive director of the Minnesota Division of the American Cancer Society.

The February meeting was held at the Mineral Springs Sanatorium. Dr. Ezra V. Bridge, medical director and superintendent of the sanatorium, spoke and conducted Auxiliary members on a tour.

In March, the Auxiliary met for luncheon at the St. James Hotel. The morning hours were devoted to preparing envelopes and kits for the Neighbor-to-Neighbor cancer fund drive. This work was done at the home of Mrs. Grant Hartnagel who is county chairman of the drive. Mrs. E. H. Juers, another Auxiliary member, is chairman of the drive in Red Wing.

The April meeting was held at the Hastings State Hospital, with luncheon at the Hotel Gardiner in Hastings. Dr. William Scheely spoke to the group and conducted a tour of the state hospital.

The May 21 meeting will be held at the Edgewood Cafe in Cannon Falls with a meeting following at the home of Mrs. Marland Williams on Lake Byllesby. Mrs. Corrin Hodgson, of Rochester, will show the film, "South of Sahari."

During June, July and August, the group will hold specially-called meetings only. In September, the meeting will be devoted to public relations, and in October, there will be a speaker on mentally-retarded children. The November meeting will be devoted to legislative matters, and in December, the group will hold its annual dinner meeting with the Goodhue County Medical Society.

St. Louis

Mrs. Earl E. Barrett, president, reports that the St. Louis County Auxiliary has presented a gift of \$250 to AMEF, has given two scholarships to student nurses and two YWCA campships, and has placed *Today's Health* in all of the public schools. "Now, to tell you of our special accomplishment," states Mrs. Barrett.

"As is true of all organizations, some women in past years worked hard and diligently for the Auxiliary and earned money the hard way—rummage sales, luncheons, keno, auctions of articles brought to meetings, and so on. Every dime and quarter counted and was invested. The amount grew and was used from time to time as a loan scholarship for nurses. Times change, however, and this particular type of scholarship was unused for several years.

"This year, we felt it was time to do something constructive with this fund, so we voted to furnish one private room at St. Luke's Hospital in Duluth and

another room at St. Mary's Hospital. Under the able and willing leadership of Mrs. M. A. Nicholson, chairman of the committee, this has been accomplished, and we now have a bronze plaque on each door and can look with pride at what can be done when an organization is as fortunate as we in having hard-working, willing and able members."

Zumbro Valley

The Zumbro Valley Medical Auxiliary, in conjunction with the American Cancer Society, held a meeting on Wednesday, March 13, at the Mayo Foundation House in Rochester. Tea was served followed by a business meeting. A film on "Breast Cancer—Self-Examination" was shown with a talk and discussion led by Dr. Elizabeth Mussey, Rochester obstetrician and gynecologist.

THOUGHTS ON BEING A MEMBER OF THE ADVISORY COMMITTEE

When Auxiliary presidents retire from office
They are commonly called "P.P.'s."
So as not to become a problem
They are given a job of ease.

Page seven in our state handbook finds
Five of us listed there.
You'll see our names and titles,
And a little space to spare.

But nary a word of our duties,
'Though instructions for others you'll see
We're sort of an honorable mention,
From our past that used to be.

But surely there must be a reason
For listing our names in print.
We must have something of value
'Though we have come to the end of our stint.

We are a sort of a vest pocket edition
To be referred to or just ignored,
But will answer your questions gladly
And assure you we won't be bored.

When your duties seem overwhelming,
And you're tired at the end of the day;
When your mind is going in circles,
And you question, "Does Auxiliary work pay?"

It is then you will find us helpful,
For our problems, too, were the same;
So, come and lean on our shoulders,
And you will find we are more than a name.

BY MRS. C. L. SHEEDY, Austin

* * *

Contributions for this column, including news and activities of state auxiliary societies and items of interest about members, may be sent to Mrs. A. B. Rosenfield, Woman's Auxiliary Editor, MINNESOTA MEDICINE, 2920 Dean Boulevard, Minneapolis, Minnesota.

REHABILITATION IN TUBERCULOSIS

(Continued from Page 334)

for such harder physical labour as packing and polishing. There is no sentiment in business and we do not ask for it; our contracts are obtained in the open market. The work is of the highest quality; there is no better workman than the rehabilitated tuberculous patient.

The settler can leave at any time if he so wishes, but a large number have remained and reared their families for periods of twenty and more years. They make their contribution to the state in income tax; they contribute to the national economy; they do not live on Government subsidies or on charity, although they know we will not see them or their families suffer should they again become ill. They do not suffer the indignity of ostracism, but live in an English Village, with the full rights of citizenship, as self-supporting and self-respecting members of their community. They enjoy, and rightfully, a position which demonstrates one aspect of the true and human end of treatment.

Many others with disability should share their lot; cardiacs, arthritics, paraplegics, psychotics, static poliomyelitis cases and respiratory cripples from non-tuberculous disease. All such of our unfortunate brethren have a right to live and work within their functional ability. "Employment is nature's best physician, and is essential to human happiness."

RICHARD R. TRAIL, M.D.
London, England

TUBERCULOSIS AND OUR STANDARD OF LIVING

The least tangible but probably the most potent factor in the existing favorable trend in mortality from tuberculosis is the general improvement in the standard of living. Greater earning power has made possible more adequate nutrition and better housing. Reduction in the average size of families has reduced overcrowding, which in turn has lessened opportunities for the spread of infection. Where economic levels have continued high, tuberculosis rates have fallen; when war or famine has intervened, they promptly rise. It is more than coincidence that the levels of tuberculosis throughout the world are closely related to the economic level of the populations concerned.—ALTON S. POPE, M.D., and JOHN E. GORDON, M.D., *Am. J. Med. Sciences*, Sept., 1955.

In Memoriam

THOMAS HUNTER DICKSON

Dr. Thomas H. Dickson, formerly Medical Director of the Minnesota Mutual Life Insurance Company with headquarters in Saint Paul, was born March 2, 1884 in Saint Paul and died March 10, 1957.

Dr. Dickson attended Central High School, where he graduated in 1900. He obtained an A.B. degree from Macalester College in 1904 and his M.D. degree from the University of Minnesota medical school in 1910. At the University, he was a member of the Nu Sigma Nu medical fraternity and maintained an active interest in his fraternity in later years. After interning at the City and County Hospital, now known as Ancker Hospital, in 1910-1911, he practiced in Saint Paul until he was appointed Assistant Medical Director of the Minnesota Mutual Life Insurance Company in 1917. In 1924, he became Associate Medical Director and, in 1935, Medical Director, which position he held until his retirement April 1, 1949.

Dr. Dickson was a member of the Association of Life Insurance Medical Directors and twice served as chairman of the medical section of the American Life Convention which is made up of medical directors and assistant medical directors of life insurance companies.

A member of the Macalester Presbyterian Church for many years, he was also one of the earlier members of the Saint Paul Athletic Club and a charter member and past president of the American International Professional Institute.

He was a member of the board of directors of the Saint Paul Y.M.C.A. from 1914 to 1944, treasurer of the organization for ten years, and president from 1939 to 1944, an office at one time held by his father, Thomas H. Dickson, Sr.

He also served as a member of the first Social Planning Committee of the Council of Social Agencies of the Saint Paul Community Chest.

Dr. Dickson was a member of the Ramsey County Medical Society, the Minnesota State Medical Association and American Medical Association from 1911 until he became affiliate member of each organization upon his retirement from active practice in 1949.

Dr. Dickson married Grace L. Vaughan-Rogers on June 22, 1916. He is survived by his widow, who now lives at 18350 Lorne Street, Reseda, California.

Dr. Dickson, "Tom" to his many friends, found his proper niche when he turned his attention to life insurance. He had a special aptitude for vital statistics and even more important, he was friendly in his contacts with people. Above all, he was a fine Christian gentleman.

CARL B. DRAKE, M.D.

CARL ALFRED INGERSON

Dr. Carl A. Ingerson, former Ramsey county coroner, died March 23, 1957. He was seventy-three years old.

He was born in February, 1884. He graduated from Hamline University, the University of Minnesota, and Marquette University, and began his practice in 1910. In 1911, he was appointed police surgeon for Saint Paul. He resigned this post in 1918 when he was elected coroner, a post he held until 1955 when he resigned because of failing health.

Dr. Ingerson was a member of Phi Rho Sigma medical fraternity, a past potentate of Osman Temple of the Shrine, past exalted ruler of the Elks, past governor of Moose Lodge 40, past president of the Minnesota State Order of Moose, a member of numerous Masonic bodies in Minnesota, a life member of the Ramsey County Medical Society, the Minnesota State Medical Association and the American Medical Association. He was also a former vice president of Local 30 of the musicians' union and attended many conventions of the Minnesota State Federation of Labor as a delegate from the Trades and Labor Assembly.

Survivors include his wife, Margaret; one son, Carl A., Jr., and one daughter, Carol, all of Saint Paul.

AUGUST EMANUEL JOHNSON

Dr. August E. Johnson, treasurer and a board member of Swedish Hospital, Minneapolis, died March 21, 1957. He was seventy-four years old.

A Minneapolis resident for more than sixty years, Dr. Johnson was born in Wisconsin and received his medical education at the Minneapolis College of Physicians and Surgeons, from which he graduated in 1903.

Specializing in surgery, Dr. Johnson was a member of the American College of Surgeons, the Hennepin County Medical Society, the Minnesota State Medical Association and the American Medical Association. He also belonged to the Arcana Masonic Lodge 187, Scottish Rite, Zuhrah Temple, the Minneapolis Athletic Club and Phi Rho Sigma fraternity.

Survivors include his wife, Marie; a daughter, Mrs. Guy Howard, Toledo, Ohio; a son, Dr. Robert E. Johnson, Minneapolis, and two sisters, Mrs. Ruth Hall, Tice, Florida, and Mrs. Vera Schindler, Mount Vernon, New York.

ALOYS PETER MAHOWALD

Dr. A. P. Mahowald, a member of the Fergus Falls State Hospital staff for the past five years, died suddenly March 10, 1957, in Fergus Falls. He was sixty-five years old.

Dr. Mahowald was born in Bird Island, Minnesota, attended St. John's University and received his medical education at St. Louis University School of Medicine in St. Louis, Missouri. During World War I he served

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THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS
230 Lowry Medical Arts Building, Saint Paul 1, Minnesota
F. H. Magney, M.D., Secretary

**TWO MINNEAPOLIS MEN ORDERED
TO SERVE TERMS FOR ABORTION**

*Re: State of Minnesota vs. William J. Dewars
and Rene Merl Albert*

On March 13, 1957, William J. Dewars, thirty-nine, 2519 East 25th Street, Minneapolis, entered a plea of guilty to an information charging him with the crime of abortion and also to a charge of having a prior conviction for a felony before the Hon. Levi M. Hall, Judge of the District Court of Hennepin County. At that time, Judge Hall sentenced the defendant to serve one year in the Minneapolis Workhouse. Dewars had previously, on March 1, 1951, been convicted in Hennepin County District Court of the crime of forgery in the second degree, at which time he was placed on probation for a period of four years, the first year being served in the Minneapolis Workhouse.

On March 26, 1957, the defendant Rene Merl Albert, twenty-five, 418 21st Avenue South, Minneapolis, was sentenced by the Hon. Michael J. Dillon, Judge of the District Court of Hennepin County, to a term of five years in the State Reformatory for Men at St. Cloud, Minnesota, pursuant to his plea of guilty, which he had previously entered on February 25, 1957, to an information charging him with the crime of abortion.

Before being sentenced by Judge Dillon, Albert also entered a plea of guilty to a charge of having a prior conviction for a felony, the defendant having been convicted of burglary in the third degree on November 21, 1953, at which time he was placed on probation for five years by the Hon. Theodore B. Knudson, Judge of the District Court of Hennepin County. Since Judge Knudson had already revoked Albert's probation on the burglary charge and had ordered him to serve a term of not to exceed five years in the State Reformatory for Men, Judge Dillon ordered that the execution of the defendant's sentence on the abortion charge be stayed and that the defendant be again brought before the Court upon his release from the reformatory for final disposition of the case. According to court records, on April 17, 1950, the defendant Albert had also been convicted in Federal District Court in Seattle, Washington, of the crime of transporting a stolen automobile across a state line, for which he was sentenced to serve eighteen months in the Federal Correctional Institute at Engelwood, Colorado.

Both defendants had been charged with the crime of abortion in a complaint issued by the Hennepin County Attorney's office on February 21, 1957, after a statement given to the authorities by a twenty-year-old Minneapolis divorcee indicated that a "doctor," who was identified as Dewars, had performed an abortion upon her by means of a catheter. Although the patient stated that both Dewars and Albert gave her injections of penicillin, she nevertheless became ill after the illegal operation and was hospitalized for five days in a Minneapolis hospital. The defendant Albert claimed that he paid over to Dewars the entire \$225.00 that was paid by the patient for the abortion. At the time of his arrest Albert was employed by a Minneapolis paint company, but he stated that he had also worked for Dewars as a "bouncer or floor man" in his tavern. Neither of the defendants has any medical training nor does either hold any type of license to practice healing in the State of Minnesota.

**ORDERLY IN MINNEAPOLIS NURSING
HOME SENTENCED FOR VIOLATION
OF DRUG ORDINANCE**

Re: State of Minnesota vs. Eugene Aron

On March 5, 1957, Eugene Aron, twenty-nine, 1416 Xerxes Ave. N., Minneapolis, was sentenced to a term of ninety days in the Minneapolis Workhouse by the Hon. Betty W. Washburn, Judge of Minneapolis Municipal Court, pursuant to his plea of guilty to a charge of having instruments in his possession for the use of narcotic drugs, in violation of the ordinances of the City of Minneapolis relating to narcotic drugs. However, Judge Washburn stayed the execution of the sentence for a period of one year and then warned the defendant that if he should become involved in similar difficulties during this time, he will be compelled to serve his sentence and also an additional ninety day sentence.

Aron, who was employed as an orderly in a Minneapolis nursing home on February 27, 1957, was arrested on March 3, 1957, after the authorities in charge of the nursing home were informed that he had given a hypodermic injection to one of the patients. When the defendant was arrested at his home the following items were found in his possession: two hypodermic needles, one eye dropper adapted to fit the hypodermic needles, one empty capsule and one steel spoon with a residue in its bowl. It was because of his possession of these articles that the defendant was charged with the crime referred to above. According to court records Aron has one previous conviction, having been sentenced on August 16, 1952, by the Hon. Thomas L. Bergin, Judge of Minneapolis Municipal Court, to a term of ninety days in the Minneapolis Workhouse on a charge of vagrancy.

ALOYS PETER MAHOWALD

(Continued from Page 345)

with the U. S. Navy. Following the war, he resided in Albany, Minnesota, where he practiced until he moved to Fergus Falls in 1952.

A member of the Park Region District and County Medical Association, Dr. Mahowald also belonged to the Minnesota State Medical Association and the American Medical Association. He is a former member of the Stearns-Benton County Medical Society. He was a member of the Order of Foresters and the Catholic Aid Association.

He is survived by his wife, Cecelia; three daughters—Mrs. P. W. Quick, Dr. Margaret Mahowald and Mary Mahowald; three sons—Theodore Mahowald, Dr. Mark Mahowald, Anthony Mahowald, S.J., and Paul Mahowald, N.S.J.; one sister—Mrs. George Nistler, Shooks, Minnesota, and three brothers—Msgr. E. Mahowald, Wadena; Anthony Mahowald, St. Cloud, and Herman Mahowald, Duluth.

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Baird, Raymond L.	Lake Crystal	
Batdorf, B. Niles	No. Mankato	
Butzer, John A.	Mankato	
Butzer, John F.	Mankato	
Chalgren, William S.	Mankato	
Conley, Robert H.	Mankato	
Dobson, Mervin W.	Mankato	
Engstrom, Robert B.	Mankato	
Eustermann, John J.	Mankato	
Fortier, Rene G.	Mankato	
†§Franchere, Frederick Wm.	Lake Crystal	
†§Fugina, George R.	Mankato	
Geurs, Benjamin R.	Mankato	
Haes, Julius E.	Mankato	
§ Hammar, Lawrence M.	Mankato	
Hankerson, Robert G.	Minnesota Lake	
† Hassett, Roger G.	Mankato	
Heimark, John J.	Mankato	
Heller, Edgar E.	Mankato	
Hoepfer, Philip G.	Mankato	
Howard, Marshall L.	Mankato	
Huffington, Herbert L.	Lutsen	
Jones, Orville H.	Mankato	
Juliar, Richard O.	Los Angeles, Calif.	
Kaufman, Walter B.	Mankato	
Kearney, Rochfort W.	Mankato	
Kemp, Alphonse F.	Mankato	
Koenigsberger, Charles G.	Mankato	
§Langhoff, Arthur H.	La Crosse, Wisc.	
Liedloff, Adolph G.	Mankato	
† Lindblom, Alton E.	No. Mankato	
Luck, Hilda	Mankato	
McNear, George R., Jr.	Mankato	
Mickelson, John C.	Mankato	
†§Miller, Victor I.	Mankato	
Morgan, Hugh O.	Amboy	
Olive, John T., Jr.	Mankato	
§ Penn, George E.	Mankato	
Roth, Frederick D.	Mankato	
Runquist, Richard K.	Good Thunder	
§ Sanford, Raymond A.	Mankato	
Scheidel, Alois M.	Mankato	
† Schmidt, Paul A.	Aurora, Illinois	
Schmitz, Anthony A.	Mankato	
Sjoding, J. Donald	Mankato	
Smith, Harry J.	Lake Crystal	
Smith, Paul M.	Lake Crystal	
Snider, Howard R.	Mankato	
*†Sohmer, Alphonse E.	Mankato	
§ Stillwell, Walter C.	Mankato	
Swenson, Donald B.	Mankato	
Thiem, Chester E.	Mankato	
Troost, Henry B.	Mankato	
Vezina, John C.	Mapleton	
Von Drasek, Joseph	Mankato	
†§Wentworth, Albert J.	Mankato	
† Williams, Hugh O.	Lake Crystal	
Wohlrahe, John C.	St. Clair	
Zee, Urban H.	Mankato	

BLUE EARTH VALLEY MEDICAL SOCIETY

Martin, Watonwan and Faribault Counties

Regular meetings, third Thursday of each month. Annual meeting in November
Number of Members—49

<i>President</i>		
COULTER, HAROLD E.	Madelia	
<i>Secretary</i>		
BOYSEN, HERBERT	Madelia	
Anderson, John W.	Blue Earth	
Armstrong, Ralph S.	Winnebago	
Barr, James S.	Elmore	
Bergman, Oscar B.	St. James	
Boysen, Herbert	Madelia	
Bratrude, Earl J.	St. James	
†Chambers, Winslow C.	Blue Earth	
Cooper, Maurice D.	Winnebago	
Coulter, Harold E.	Madelia	
Drexler, George W.	Blue Earth	
Gamm, Edgar R.	Triumph	
Gardner, Jack K.	Ceylon	
Gardner, Victor H.	Fairmont	
Halverson, Donald E.	Winnebago	
Halverson, William G.	Madelia	
Hanson, Lewis	Frost	
Heimark, Julius J.	Fairmont	
Hruza, William J.	Madelia	
†Hunt, Roscoe C.	Clearwater Beach, Fla.	
Kraemer, George N.	Fairmont	
Krause, Carl W.	Fairmont	
Lester, Malcolm J., Jr.	Truman	
Lindahl, Merlyn J.	Sherburn	
Louisell, Charles T.	Fairmont	
† McGroarty, John J.	Easton	
Matson, Albert D.	St. James	
Mills, John L.	Winnebago	
† Misbach, William D.	Sherman Oaks, Calif.	
Moulton, Keith B.	St. James	
§ Nickerson, John R.	Fairmont	
§ Nickerson, Neil D.	Fairmont	
§ Ourada, Anthony L.	Fairmont	
§ Parsons, R. A.	St. James	
§ Parsons, Ralph L.	Monterey	
† Rollins, Troy G.	Rochester	
†§Rovestad, Roger A.	White Plains, N. Y.	
§ Russ, Homer H.	Blue Earth	
Schulz, Robert W.	Fairmont	
Smith, Don V.	Blue Earth	
§ Snyder, Clifford D.	Kiester	
Thayer, Ellsworth A.	Fairmont	
Vaughn, Victor M.	Truman	
Virnig, Mark P.	Wells	
Virnig, Richard P.	Wells	
Wandke, Otto E.	Fairmont	
Watkins, John A.	Wells	
Williamson, Harold A.	Fairmont	
† Wilson, Clyde E.	Blue Earth	
§ Zemke, Erhart E.	Fairmont	

BROWN COUNTY MEDICAL SOCIETY

Brown County

Regular meetings, quarterly. Annual meeting in January
Number of Members—28

<i>President</i>		
BLACK, WILLIAM A.	New Ulm	
<i>Secretary</i>		
KAISER, MILTON L.	New Ulm	
Black, William A.	New Ulm	
Burnett, Joseph W.	New Ulm	
Cairns, Robert J.	Redwood Falls	
Carthey, Frank J.	New Ulm	
§Dubbe, Frederick H.	New Ulm	
Dysterheft, Adolf F.	Gaylord	
§ Fesenmaier, Otto B.	New Ulm	
§ Fritsche, Albert	New Ulm	
§ Fritsche, Carl J.	New Ulm	
§ Fritsche, Theodore R.	New Ulm	
§ Goblirsch, Andrew P.	Sleepy Eye	
§ Hovde, Rolf	Winthrop	
§ Kaiser, Milton L.	New Ulm	
§ Keithahn, Elmer E.	Sleepy Eye	
§ Kitzberger, Peter J.	New Ulm	
§ Kruszich, Stephen J.	Sleepy Eye	
†§Kuske, Arthur L.	New Ulm	
§ Muesing, William J.	New Ulm	
§ Nuessle, Walter G.	Springfield	
§ Penk, Engward L.	Springfield	
§ Peterson, Roy A.	Vesta	
†§Reineke, George F.	New Ulm	
§ Rimas, Matthew J.	Comfrey	
§ Saffert, Cornelius A.	New Ulm	
§ Schroepfel, John E.	Winthrop	
§ Seifert, Otto J.	New Elm	
§ Vogel, Howard A. L.	New Ulm	
§ Wohlrahe, Edwin J.	Springfield	

COUNTY SOCIETY ROSTER

CAMP RELEASE DISTRICT MEDICAL SOCIETY Chippewa, Lac qui Parle and Yellow Medicine Counties

Regular meetings, second Thursday each month except July and August. Annual meeting,
second Thursday in December
Number of Members—33

<i>President</i>			‡ Flom, Robert S.....Columbus, Ga.	Larson, Dorette W.....Madison
HUSTAD, EDWARD G.....Montevideo			§ Guilbert, G. D.....Minneapolis	§ Lima, Ludvig R., Jr.....Montevideo
<i>Secretary</i>			§ Hauge, Malvin I.....Clarkfield	§ Lundell, Carl L.....Granite Falls
ODLAND, OLIN M.....Granite Falls			† Holmberg, LeRoy J.....Canby	§ Maus, Philip.....Dawson
§ Allen, John H.....Montevideo			§ Hudac, Elwyn R.....Echo	§ Miller, William P.....Montevideo
§ Anderson, Chester A.....Madison			§ Hustad, Edward G.....Montevideo	§ Nelson, Melvin S.....Granite Falls
§ Barr, Ronald W.....Montevideo			§ Johnson, Vilhelm M.....Dawson	§ Odland, Olin M.....Granite Falls
§ Boody, George J., Jr.....Sandstone			† Jordan, Kathleen B. Smith.....Granite Falls	§ Owens, William A.....Montevideo
§ Burns, Floyd M.....Milan			§ Jordan, Lewis S.....Granite Falls	§ Perlt, Albert L.....Canby
§ Burns, M. Alpheus.....Milan			§ Kaufman, William C.....Appleton	§ Roust, Henry A.....Montevideo
§ Camp, Ray Junior.....Madison			† Krystosek, Lee A.....Madison, Wisc.	§ Schmidt, Paul G., Jr.....Granite Falls
§ Fallon, Virgil T.....Dawson			§ Larson, Arthur N.....Madison	§ Westby, Magnus.....Madison
				§ Westby, Norval M.....Madison

CLAY-BECKER COUNTY MEDICAL SOCIETY

Clay and Becker Counties

Regular meetings, spring and fall. Annual meeting, last week in November
Number of Members—26

<i>President</i>			§ Duncan, James W.....Moorhead	‡ Oliver, James O.....New York, N. Y.
BIGLER, IVAN R.....Perham			§ Geib, Marvin J.....Moorhead	† Otto, Henry.....Frazee
<i>Secretary</i>			† Hagen, Olaf J.....Moorhead	§ Rice, Hagbart G.....Moorhead
DODDS, WILLIAM C.....Detroit Lakes			§ Houghlum, Arvid J.....Lake Park	§ Rutledge, John B.....Detroit Lakes
§ Bigler, Earl E.....Perham			§ Humphrey, Edward W.....Moorhead	§ Rutledge, Lloyd H.....Detroit Lakes
§ Bigler, Ivan E.....Perham			§ Johnson, Olga H.....Moorhead	§ Saxman, Gertrude.....Georgetown
§ Bottolfsen, Bottolf T.....Moorhead			§ Larson, Arnold.....Detroit Lakes	§ Simson, Carl.....Barnesville
§ Carlson, Vernon J.....Moorhead			§ Lorentzen, Ernest S.....Detroit Lakes	† Thysell, Fred A.....Moorhead
§ Dodds, William C.....Detroit Lakes			§ Midthune, Andreen S.....Lake Park	§ Thysell, Vernon D.....Hawley
			§ Moberg, Clarence W.....Detroit Lakes	§ Watson, Virgil A.....Detroit Lakes
			§ Odland, Mark E.....Detroit Lakes	

EAST CENTRAL MINNESOTA MEDICAL SOCIETY

Anoka, Chisago, Isanti, Kanabec, Mille Lacs, Pine and Sherburne Counties

Regular meetings, first Tuesday of every other month of the year.

Annual meeting, first Tuesday in December

Number of Members—45

<i>President</i>			§ Halpin, Joseph E.....Rush City	§ Nordman, Willard F.....Mora
MAGNUSON, RAYMOND C.....Cambridge			§ Hedenstrom, Paul H.....Cambridge	§ Nygren, William T.....Braham
<i>Secretary</i>			§ Henry, Harold W.....Hinckley	§ Peterson, Alvin C.....Mora
TESCH, GORDON H.....Elk River			§ Holmes, Alva E.....Rush City	§ Pone, John.....Cambridge
§ Adkins, Galen H.....Cambridge			§ Hubin, Edwin G.....Sandstone	§ Roehlike, Arthur B.....Elk River
§ Ahlstrom, Robert C.....Braham			§ Johnson, Aldridge F.....Isle	§ Schut, John W.....Anoka
§ Albrecht, Harold H.....Chisago City			§ Johnson, Robert H.....Chisago City	§ Spurzem, Raymond J.....Anoka
§ Berge, Harry L.....Mora			§ Kapsner, Alfred T.....Princeton	† Stahn, Louis H.....Modesto, Calif.
§ Bossert, Clarence S.....Mora			† Kelsey, Carleton G.....St. Paul	§ Stratte, Alf K.....Pine City
§ Bunker, Bevan W.....Anoka			§ Larson, Gerald E.....Cambridge	§ Swenson, Roy G.....North Branch
§ Burseth, Edgar C.....Mora			§ Lee, Henry M.....Cambridge	§ Tesch, Gordon H.....Elk River
§ Courteau, Robert D.....Onamia			§ McManus, William F.....Princeton	§ Textor, Jerome.....Anoka
† Dredge, Homer P.....Sandstone			§ Mach, Ralph F.....Pine City	§ Vik, Melvin.....Cambridge
§ Fryling, Vera B.....Anoka			§ Magnuson, Raymond C.....Cambridge	§ Wadsworth, George L.....Cambridge
§ Gully, Raymond J.....Anoka			§ March, Kenneth A.....Cambridge	† Waller, Joseph D.....Pine City
§ Fort Meade, So. Dak.			§ Metcalf, Norman B.....Princeton	† Woyda, William C.....Minneapolis
			§ Nelson, Luther A.....Rush City	§ Zinn, Charles W.....Elk River

FREEBORN COUNTY MEDICAL SOCIETY

Freeborn County

Regular meetings, third Thursday of even months. Annual meeting, December

Number of Members—34

<i>President</i>			§ Ellertson, Leonard M.....Albert Lea	§ Neel, Harry B.....Albert Lea
ERDAL, OVE A.....Albert Lea			§ Erdal, Ove A.....Albert Lea	§ Nelson, Charles H.....Albert Lea
<i>Secretary</i>			§ Folken, Frank G.....Albert Lea	§ Nelson, Clayton E.....Albert Lea
STEINER, LEON E.....Albert Lea			† Freeman, John P.....Glenville	§ Nesheim, Martin O.....Emmons
§ Barr, Lowell C.....Albert Lea			§ Gamble, Elbert J.....Albert Lea	§ Palmer, Clinton F.....Albert Lea
§ Bartness, John.....Albert Lea			§ Gill, Theodore.....Albert Lea	§ Person, John P.....Albert Lea
§ Burns, Catherine.....Albert Lea			† Gullickson, Andrew.....Minneapolis	§ Prins, Leo R.....Albert Lea
§ Butturff, Carl R.....Freeborn			§ Hansen, Theodore M.....Albert Lea	§ Schmidt, Ruben F.....Alden
† Calhoun, Frank W.....Albert Lea			§ Holian, Darwin K.....Albert Lea	† Schultz, J. Albert.....Albert Lea
§ Demo, Robert A.....Albert Lea			§ Kaasa, Lawrence J.....Albert Lea	§ Sherman, Alfred G.....Albert Lea
§ Donovan, Daniel L.....Albert Lea			§ Keil, Marcus A.....Albert Lea	§ Steiner, Leon E.....Albert Lea
§ Egge, Sanford G.....Albert Lea			† Leopard, Brand A.....Brownsville, Texas	§ Whitson, Sidney A.....Albert Lea
			§ Menefee, Edward C.....Albert Lea	§ Wilcox, G. Charles.....Albert Lea

COUNTY SOCIETY ROSTER

GOODHUE COUNTY MEDICAL SOCIETY

Goodhue County

Regular meetings, second Thursday. Annual meeting, December

Number of Members—27

<i>President</i>	
KIMMEL, GEORGE C.	Red Wing
<i>Secretary</i>	
HAWLEY, GEORGE M. B.	Red Wing
† Aanes, Almer M.	Red Wing
Atkins, Willard M.	Red Wing
Boswell, J. Thornton	Kenosha, Wis.
Bridge, Ezra V.	Cannon Falls
Brusegard, James F.	Red Wing
Claydon, Howard F.	Red Wing

DeGeest, James H.	Miller, So. Dak.
Dovenmuehle, Robert H.	Durham, N. C.
Falls, John L.	Red Wing
Graves, Richard B.	Red Wing
Halvorson, James W.	Zumbrota
Hamilton, Samuel L.	Red Wing
Hartnagel, Grant F.	Red Wing
Hawley, George M. B.	Red Wing
Jones, Alvah W.	Red Wing
Juers, Edward H.	Red Wing
Kimmel, George C.	Red Wing

Larson, Oliver E. H.	Zumbrota
Liffrig, William W.	Red Wing
Miller, Winston R.	Red Wing
Molenaar, Robert E.	Cannon Falls
Sherman, Royal V.	Red Wing
Smith, Myron W.	Red Wing
Steffens, Leon A.	Red Wing
Walter, William E.	Wanamingo
Wasmund, Clarence W.	Red Wing
Williams, Marland R.	Cannon Falls

HENNEPIN COUNTY MEDICAL SOCIETY

Hennepin County

Regular meetings, first Monday of each month, October through May.

Annual meeting, first Monday in October

Number of Members—1,028

<i>President</i>	
DRILL, HERMAN E.	Hopkins
<i>Secretary</i>	
HOLMBERG, CONRAD J.	Minneapolis
<i>Executive Secretary</i>	
COOK, THOMAS P.	Minneapolis
Abernathy, Robert S.	Minneapolis
Abramson, Milton	Minneapolis
Adkins, Charles D.	Minneapolis
† Agustsson, Hreidar	Aberdeen, Maryland
Ahern, Eugene E.	Minneapolis
Alexander, Harlan A.	Minneapolis
Aling, Charles A.	Minneapolis
Althausen, Theodore L., Jr.	Minneapolis
† Altnow, Hugo O.	Coral Gables, Fla.
Amatuzio, Donald S.	Minneapolis
Andersen, Silas C.	Minneapolis
Andersen, Arnold S.	St. Louis Park
Andersen, David M.	St. Louis Park
Andersen, Edward D.	Gstada, Switzerland

Anderson, Ernest R.	Minneapolis
Anderson, Frank J.	Minneapolis
Anderson, John A.	Minneapolis
Anderson, John T.	Minneapolis
Anderson, Karl W.	Minneapolis
Anderson, Richard W.	St. Paul
Anderson, Roger L.	Minneapolis
Anderson, U. Schuyler	Minneapolis
Anderson, Wallace E.	Minneapolis
Anderson, William H.	Minneapolis
Anderson, William T.	Minneapolis
Andreassen, Einer C.	St. Paul
Andreassen, Rolf L.	Minneapolis
Andresen, Karl D'A.	Minneapolis
Andrews, Robert S.	Minneapolis
Anker, Frank J.	Minneapolis
Anonsen, Richard E.	Minneapolis
† Arends, Archabald L.	Minneapolis
† Arey, Stuart Lane	Minneapolis
Arhelger, Stuart W.	Minneapolis
Arlander, Clarence E.	Minneapolis
Arling, Leonard S.	Minneapolis
Arms, James J.	Minneapolis
Armstrong, Byron H.	Hopkins
Arnold, Ann W.	Minneapolis
Arvidson, Carl G.	Minneapolis
† Aune, Martin	Minneapolis
Baggenstoss, Osmond J.	Minneapolis
Bagley, Russell W.	Minneapolis
Baird, Joseph W.	Minneapolis
Baken, Melvin P.	Minneapolis
Baker, Abe B.	Minneapolis
† Baker, Alfred T.	Minneapolis
Baker, Milton E.	Minneapolis
Baleisis, Peter	Minneapolis
Balogh, Samuel G.	Minneapolis
Balogh, Charles J.	Minneapolis
Bank, Harry E.	San Francisco, Calif.
Barno, Alex.	St. Louis Park
Barr, Maxwell M.	Minneapolis
Barr, Robert N.	Minneapolis
Barron, Jesse J.	Minneapolis
† Barron, Moses	Minneapolis
Barron, S. Steven	Minneapolis
Beach, Northrop	Minneapolis
† Becker, Arnetta M.	Lincoln, Nebraska
Bedford, Edgar W.	Minneapolis
Beirstein, Samuel	Minneapolis
Beiswanger, Richard H.	Minneapolis
† Bell, Elexious T.	Minneapolis

Bellville, Titus P.	Minneapolis
Belzer, Meyer S.	Minneapolis
Benesh, Louis A.	Minneapolis
Benjamin, Edwin G.	Minneapolis
Benjamin, Harold G.	Minneapolis
Berg, Clinton C.	Wayzata
Berger, Alex G.	Minneapolis
Bergh, George S.	Minneapolis
Bergh, Solveig M.	Minneapolis
Berglund, Eldon B.	Minneapolis
Bergquist, James R.	Minneapolis
Berkwitz, Nathaniel J.	Minneapolis
Bernan, Reuben	Minneapolis
Bernstein, Irving C.	Minneapolis
Bessens, Alfred N., Jr.	Minneapolis
Bevis, William D.	Minneapolis
Bieter, Raymond N.	Minneapolis
Bilka, Paul J.	Minneapolis
Binder, Manuel R.	Minneapolis
Bjornson, Robert G. B.	Minneapolis
Blake, Allan J.	Hopkins
Blake, James A.	Minneapolis
Blake, Paul S.	Hopkins
Blodet, Traugott J.	Osseo
Blomberg, Robert D.	Minneapolis
Blomberg, William R.	St. Paul
Bloom, Norman B.	Minneapolis
Blumenthal, Jacob S.	Minneapolis
Boehrer, John J., Jr.	Minneapolis
Bofenkamp, Benjamin	Minneapolis
Bohn, Donald G.	Minneapolis
Boies, Lawrence R.	Minneapolis
Booth, Albert E.	Minneapolis
† Boreen, Clifton A.	Minneapolis
† Borgeson, Egbert J.	St. Paul
Borman, Chauncey N.	Minneapolis
Borowicz, Leonard A.	Minneapolis
Bowers, Gordon G.	Minneapolis
Boynton, Ruth E.	Minneapolis
Brasch, John W.	Minneapolis
† Bratrud, Arthur F.	Minneapolis
Breitenbucher, Robert B.	Minneapolis
Brekke, Harvey J.	Minneapolis
Bridge, Allyn G.	Minneapolis
Brill, Alice K.	Minneapolis
† Brooks, Charles N.	Minneapolis
† Brown, Edgar D.	St. Petersburg, Florida
Brown, Ian A.	Minneapolis
Brown, William D.	Minneapolis
Buchstein, Harold F.	Minneapolis
Buirge, Raymond E.	Minneapolis
† Bulkley, Kenneth	Minneapolis
Burnham, Wesley H.	Minneapolis
Busbard, Wilfred J.	Minneapolis
Buzzelle, Leonard K.	Minneapolis
Cable, Morris L.	Minneapolis
Cabot, Clyde M.	Minneapolis
Cady, Laurence H.	Minneapolis
Cameron, Isabell L.	Minneapolis
† Campbell, Lowell M.	Minneapolis
Campbell, Orwood J.	Minneapolis
Caplan, Leslie	Minneapolis
Card, William H.	Minneapolis
Carey, James B.	Minneapolis
Carlander, Lester W., Jr.	Minneapolis
Carlson, Charles V.	Mound
Carlson, Lawrence	Minneapolis
Carlson, Leonard T.	Minneapolis
Caron, Robert P.	Minneapolis
Carr, William J.	Minneapolis
Caspers, Carl G.	Minneapolis
Cable, Charles F.	Minneapolis
† Cavanor, Frank T.	Minneapolis

† Ceder, Elmer T.	Minneapolis
Chadbourn, Wayne A.	Minneapolis
Challman, S. Alan	Minneapolis
Chesler, Merrill D.	Minneapolis
Child, Sherman B.	Minneapolis
Chisholm, Tague C.	Minneapolis
Christensen, Llewellyn E.	Minneapolis
Clark, Malcolm D.	Minneapolis
Clark, Robert S.	Minneapolis
Clay, Lyman B.	Minneapolis
† Cochrane, Ray F.	Minneapolis
Coe, John I.	Minneapolis
† Cohen, Bernard A.	Minneapolis
Cohen, Ephraim B.	Minneapolis
Cohen, Henry W.	Minneapolis
Cohen, Maynard M.	St. Paul
† Cohen, Sumner S.	Oak Terrace
Cole, James S.	Minneapolis
Cooper, Robert R.	Minneapolis
Cornea, Albert D.	Minneapolis
† Correa, Dale H.	Waltham, Mass.
Corrigan, Cyril J.	Minneapolis
Cowan, Donald W.	Minneapolis
Craig, M. Elizabeth	Minneapolis
† Cranmer, Richard R.	Minneapolis
Cranston, Robert W.	Minneapolis
Creedy, Charles D.	Minneapolis
Culligan, Leo C.	Minneapolis
Cundy, Donald T.	Minneapolis
Cushing, Richard T.	St. Louis Park
† Cutts, George	Minneapolis
† Dady, Elmer E.	Minneapolis
Daggett, Donald R.	Minneapolis
Dahl, Elmer O.	Minneapolis
Dahl, James C.	Minneapolis
Dahl, John A.	Minneapolis
† Daniel, Donald H.	Minneapolis
† Danyluk, Michael	Minneapolis
Dargay, Cyril P.	Minneapolis
David, Reuben	Hopkins
Davis, Jay C.	Minneapolis
Davis, William I.	Mound
del Plaine, Carlos W.	Minneapolis
Devereaux, Thomas J.	Wayzata
† DeWall, Richard	Minneapolis
† Dickman, Roy W.	Monterey, Calif.
† Diefenbach, Eugene J., Jr.	Minneapolis
Diehl, Harold S.	Minneapolis
Dierker, Heinrich	Minneapolis
Diessner, Henry D.	Minneapolis
Doan, Robert E.	Wayzata
Donatelle, Edward P.	Minneapolis
Dorge, Richard I.	Minneapolis
† Dornblaser, Harry B.	Los Gatos, Calif.
Dorsey, George C.	Minneapolis
Doscherholmen, Alfred	Minneapolis
† Doxey, Gilbert L.	Minneapolis
Doyle, Lawrence O.	Minneapolis
† Drake, Charles R.	Minneapolis
Drill, Herman E.	Hopkins
Duff, Edwin R.	Minneapolis
Dummer, Donald J.	New Brighton
Dunlap, Earl H.	Minneapolis
Dupont, Joseph A.	Excelsior
Duryea, Marby	Minneapolis
Duryea, Willis M.	Minneapolis
Duryea, Willis M., Jr.	Minneapolis
Dvorak, Benjamin A.	Minneapolis
Dwan, Paul F.	Minneapolis
Dworsky, Samuel D.	Minneapolis
Eder, Walter P.	Minneapolis
Ehrenberg, Claude J.	Minneapolis

COUNTY SOCIETY ROSTER

Ehrlich, S. Paul.....	Minneapolis	†§Gratzek, Frank R.....	Minneapolis	Jerome, Bourne	Minneapolis
Eich, Matthew A.....	Minneapolis	Gray, Royal C.....	Minneapolis	Jerome, Elizabeth K.....	Minneapolis
Eichhorn, Edmund P., Jr.....	Minneapolis	Green, Clayton Robbie.....	Excelsior	Jeb, Robert P.....	Minneapolis
Eisenstadt, David H.....	Minneapolis	Green, Robert A.....	St. Louis Park	Johnson, Angelo G.....	Minneapolis
Eisenstadt, William S.....	Minneapolis	Greenberg, Albert J.....	Minneapolis	Johnson, Arthur B.....	Minneapolis
Eitel, George D.....	Minneapolis	Greenfield, Irving.....	Minneapolis	Johnson, August E.....	Minneapolis
Eli, Earl W.....	Minneapolis	Greishiemer, Esther M.....	Philadelphia, Pa.	Johnson, David R.....	Minneapolis
Ellison, David E.....	Minneapolis	Grimes, Marian.....	Minneapolis	Johnson, Frank E.....	Minneapolis
Ellison, Ellis.....	Minneapolis	Grimmell, Francis J.....	Minneapolis	Johnson, Harry A.....	Minneapolis
Elwood, Paul M., Jr.....	Minneapolis	Gronvall, Paul R.....	Minneapolis	Johnson, James A.....	Minneapolis
Elrod, Calvin R.....	Long Lake	Grotting, John K.....	Minneapolis	Johnson, John W.....	Minneapolis
Emond, Albert J.....	Farmington	Gullickson, Glenn, Jr.....	Minneapolis	Johnson, Julius.....	Minneapolis
Emond, Joseph S.....	Farmington	Gunlaugson, Frederick G.....	Minneapolis	Johnson, Malcolm R.....	Minneapolis
Engel, Joseph P.....	Minneapolis	Gushurst, Edward G.....	Minneapolis	Johnson, Norman P.....	Minneapolis
Engelhart, Peter C.....	Minneapolis			Johnson, Norman Paul.....	Minneapolis
Englund, Elvin F.....	Minneapolis	Haberer, Helen R.....	Minneapolis	Johnson, Norton T.....	Minneapolis
Engstrand, Oscar J.....	Minneapolis	Hagen, Kristofer.....	Richfield	Johnson, Reinald G.....	Minneapolis
Engstrom, Denton P.....	Minneapolis	Hagen, Wayne S.....	Minneapolis	Johnson, Reuben A.....	Minneapolis
Erickson, Clifford O.....	Minneapolis	Haggard, George D.....	Minneapolis	Johnson, Richard S.....	Minneapolis
Erickson, Laurence F.....	Minneapolis	Hall, Harry B.....	Minneapolis	Johnson, Robert E.....	Minneapolis
Erickson, Myron E.....	Minneapolis	Hall, Wendell H.....	Minneapolis	Johnson, Roger S.....	Wayzata
Erickson, Reuben F.....	Minneapolis	Hamel, Joseph I.....	Minneapolis	Johnson, Ronald G.....	Coronado, Calif.
Erlanson, Andrew C.....	St. Paul	Hannah, Hewitt B.....	Minneapolis	Johnson, Youbert T.....	Minneapolis
Esensten, Sidney.....	Minneapolis	Hansen, Cyrus O.....	Minneapolis	Jones, David G.....	Minneapolis
Evans, Edward T.....	Minneapolis	Hansen, Erling W.....	Minneapolis	Jones, Herbert W., Jr.....	Minneapolis
Evans, Robert D.....	Minneapolis	Hansen, Olga S.....	Minneapolis	Jones, Richard H.....	Minneapolis
		Hansen, Rollin M.....	Minneapolis	Jones, William R.....	Minneapolis
Fahr, George E.....	Minneapolis	Hanson, Harlow J.....	Minneapolis	Josewich, Alexander.....	Minneapolis
Fansler, Walter A.....	Minneapolis	Hanson, Harold B.....	Minneapolis	Judd, Allen S.....	Minneapolis
Feeney, John M.....	Minneapolis	Hanson, Henry V.....	Minneapolis	Judd, Walter H.....	Washington, D. C.
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Nordin, Gustaf T.....Saratoga, Calif.
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Nordland, Martin, Jr.....Minneapolis
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Petersen, Peter C.....Minneapolis
Petersen, William E.....Minneapolis
Peterson, Alice H.....Minneapolis
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Peterson, Nordahl P.....Minneapolis
† Peterson, Oliver H.....Minneapolis
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† Peterson, Peter E.....Minneapolis
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† § Petit, Leon J.....Minneapolis

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Spink, Wesley W.....	Minneapolis	†Ulrich, Henry L.....	Minneapolis	Zarling, V. Richard.....	Minneapolis
Spensel, Kenath H.....	Minneapolis	†Ulvestad, Harold S.....	Minneapolis	Zaworski, Leo A.....	Minneapolis
Spratt, Charles N.....	Minneapolis	Undine, Clyde A.....	Minneapolis	Zierold, Arthur A.....	Minneapolis
Stahr, Aubrey C.....	Hopkins	Utendorfer, Robert W.....	Minneapolis	Zinter, Ferdinand A.....	Minneapolis
		†Vermund, Halvor.....	Minneapolis	Ziskin, Thomas.....	Minneapolis

KANDIYOHI-SWIFT-MEEKER COUNTY MEDICAL SOCIETY

Kandiyohi, Swift, and Meeker Counties

Regular meetings, third Thursday. Annual meeting, third Thursday in November

Number of Members—56

<i>President</i>		§ Gaebe, Milton B.....	Clara City	†§O'Connor, Daniel C.....	Eden Valley
BOSLAND, HOWARD G.....	Willmar	Giere, Silas W.....	Benson	Olson, Gregory M.....	Litchfield
<i>Secretary</i>		§ Gilman, Lloyd C.....	Willmar	§ Opsahl, Lawrence J.....	Willmar
OPSAHL, LAWRENCE J.....	Willmar	Griffin, Richard P.....	Benson	*†Penhall, Fletcher W.....	Morton
Anderson, Richard E.....	Willmar	Guy, Jack A.....	New London	§ Peterson, Willard E.....	Willmar
† Austrian, Sol.....	St. Paul	Helwig, Karl L., Jr.....	Kerkhoven	Pilgrim, Robert D.....	Benson
§ Bosland, Howard G.....	Willmar	Herbst, Richard F.....	Willmar	† Porter, Oliver M.....	Atwater
Bradley, Nelson J.....	Willmar	Hinz, Walter E.....	Willmar	§ Proeschel, Ray K.....	Willmar
Chunn, Stanley S.....	Willmar	Hodapp, Robert V.....	Willmar	§ Rorem, Joseph A.....	Appleton
† Daignault, Oscar.....	Benson	Holm, Donald F.....	Benson	§ Ruchie, Warren H.....	Willmar
† Danielson, Karl A.....	Litchfield	Houts, Joseph C.....	Dassel	§ Rygh, Harold N.....	Atwater
† Danielson, Lennox.....	Litchfield	§ Jacobs, Douglas L.....	Willmar	§ Schnell, Frederick S.....	Litchfield
† Dille, Donald E.....	Igo, S. D.	† Jacobs, Johannes C.....	Willmar	†§Solsem, Frederick N. S.....	Spicer
§ Docksey, John W.....	Willmar	Johnson, Marvin W.....	Dassel	§ Sorum, Frithjof T.....	Willmar
§ Douglas, Kenneth W.....	Sandstone	† Kaufman, Edward J.....	Appleton	† Sutherland, W. H.....	Spicer
Eberley, Tobe S.....	Benson	† Lundblad, Robert M.....	Minneapolis	Thompson, Russell A.....	Cosmos
§ Ellinger, Albert J.....	Willmar	§ McCarthy, Austin M.....	Willmar	Wagner, Norman W.....	Benson
Fedor, Robert D.....	Litchfield	MacKlin, William E., Jr.....	Willmar	† Williams, Francis R.....	Litchfield
Frederickson, Alice C.....	Willmar	§ Meinert, John K.....	Willmar	Wilmot, Cecil A.....	Litchfield
		§ Michels, Roger P.....	Willmar	Wilmot, Harold E.....	Litchfield
		§ Nelson, Robert H.....	Benson		

COUNTY SOCIETY ROSTER

LYON-LINCOLN COUNTY MEDICAL SOCIETY

Lyon and Lincoln Counties

Regular meeting, 6-week period in spring and fall. Annual meeting, November

Number of Members—26

President
MYERS, JOHN W.....Canby
Secretary
HEDENSTROM, PHILIP C.....Marshall
Bodaski, Albert A.....Tyler
Boyle, Francis J.....Tracy
Eckdale, John E.....Marshall
Ferguson, William C.....Walnut Grove
Ford, Burton C.....Marshall

† Gray, Frank D.....Marshall
Hedenstrom Philip C.....Marshall
Hermanson, Peter E.....Hendricks
Hoidale, Andrew D.....Tracy
Johnson, C. Percy.....Tyler
Kreuzer, Titus C.....Marshall
Larson, Milo H.....Lake Benton
Lee, Norman J.....Tracy
Monson, Leonard J.....Canby
Kreuzer, Titus C.....Marshall
Myers, John W.....Canby

§ Peterson, Kenenth A.....Marshall
§ Remsberg, Robert R.....Tracy
§ Smith, Lloyd A.....Willmar
§ Thill, Leonard J.....Balaton
§ Thompson, Carl O.....Hendricks
†§ Vadheim, Alfred L.....Tyler
†§ Valentine, Walter H.....Tracy
§ Wolstan, Simon. D.....Minneota
§ Workman, Warner G.....Tracy
§ Yaeger, Wilbert W.....Marshall

McLEOD COUNTY MEDICAL SOCIETY

McLeod County

Regular meetings, third Thursday of each month.

Annual meeting, third Thursday in December

Number of Members—22

President
SMITH, GEORGE R.....Hutchinson
Secretary
BRETZKE, CARL O.....Hutchinson
Bretzke, Carl O.....Hutchinson
Brink, Donald M.....Hutchinson
Carroll, John J.....Winsted
† Clement, John E.....Lester Prairie

§ Griebie, Grant L.....Brownston
Howell, Milton.....Glencoe
†§ Huebert, Dan W.....Hutchinson
Jensen, Alvin M.....Brownston
†§ Klima, William W.....Stewart
§ Lippmann, Elmer W.....Hutchinson
McNeil, Maurice R.....Glencoe
§ Neumaier, Arthur.....Glencoe
†§ Peterson, Kenneth H.....Hutchinson

§ Rayner, Ralph R.....Glencoe
§ Sahr, Walter G.....Hutchinson
† Scholpp, Otto W.....Hutchinson
§ Selmo, Joseph D.....Norwood
§ Sheppard, Charles G.....Hutchinson
§ Smith, George R.....Hutchinson
§ Smyth, John J.....Lester Prairie
†§ Struxness, David F.....Glencoe
§ Truesdale, Clark W.....Glencoe

MOWER COUNTY MEDICAL SOCIETY

Mower County

Regular meetings, last Thursday of every month. Annual meeting, December

Number of Members—41

President
VAN CLEVE, HORATIO P.....Austin
Secretary
ROSENTHAL, F. HAROLD.....Austin
Anderson, David P.....Austin
Anderson, Harold J.....Austin
Anderson, Wallace R.....Austin
Baker, Theodore, Jr.....Austin
Barber, Tracy E.....Austin
Cronwell, Bernhard J.....Austin
Elliott, Harold J.....Hayfield
Fetzek, Albert D.....Austin
Fisch, Herbert M.....Austin
Flanagan, Leonard G.....Austin

§ Grise, William B.....Austin
Hagen, John D.....Austin
† Havens, John G. W.....Austin
† Hegge, Olav H.....Austin
† Hertel, Garfield E.....Austin
§ Hesla, Inman A.....Austin
§ Leck, Paul C.....Austin
§ Lommen, Peter A.....Austin
§ Lommen, Peter A., Jr.....Austin
§ McKenna, Elizabeth.....Austin
§ McKenna, Jay K.....Austin
† Melzer, George R.....Lyle
§ Miller, Herman.....Austin
§ Morse, Morton P.....LeRoy
† Murray, Roger C.....Austin

§ Nesse, James A.....Austin
§ Osborn, Donald O.....Austin
§ Peterson, Stanley C.....Austin
§ Peterson, W. H.....Austin
§ Robertson, Paul A.....Austin
§ Rosenthal, F. Harold.....Austin
§ Sargent, Edward C., Jr.....Austin
§ Schneider, Paul J.....Adams
§ Seery, Thomas M.....Austin
§ Sheedy, Chester L.....Austin
§ Stahl, George W.....Austin
§ Thomson, James M.....Austin
§ Twiggs, Leo F.....Austin
§ Van Cleve, Horatio P.....Austin
§ Wright, Robert R.....Austin

NICOLLET-LE SUEUR COUNTY MEDICAL COUNTY

Nicollet and Le Sueur Counties

Regular meeting, first Monday of alternate months. Annual meeting, December

Number of Members—26

President
GRIDLEY, JOHN W.....Arlington
Secretary
CURTIS, RAUEN A.....LeCenter
† Branham, Donald S.....Deer Park, Wisc.
Canfield, Wayne W.....St. Peter
Covell, Walter W.....St. Peter
† Curtis, Rauen A.....LeCenter
† Ericson, Swan.....Los Angeles, Calif.

§ Gislason, Solvig T.....St. Peter
Gridley, John W.....Arlington
Grimes, Burton P.....St. Peter
Hiniker, Peter J.....Le Sueur
Huffington, Herb L., Jr.....Waterville
Johnson, Hobart C.....North Mankato
† Kabrick, Ola A.....St. Peter
Kath, Reinhard H.....Arlington
Lenander, Melvin E.....St. Peter
Limbeck, Donald A.....Le Sueur
§ Nilson, Helmer J.....North Mankato

§ Olmanson, Edmund G.....St. Peter
§ Olson, Duane O.....Gaylord
§ Rudie, Clifford N.....St. Peter
§ Schulberg, Verne A.....Gaylord
§ Sjostrom, Lawrence E.....St. Peter
§ Sonnesyn, Nels N.....Le Sueur
§ Strathern, Carleton S.....St. Peter
†§ Strathern, Fred P.....St. Peter
§ Traxler, J. Felix.....Henderson
§ Wohlrabe, Clarence F.....North Mankato

PARK REGION DISTRICT AND COUNTY MEDICAL SOCIETY

Douglas, Grant, Otter Tail, Wilkin Counties

Regular meetings, March, June and September. Annual meeting, December.

Number of Members—65

President
O'BRIEN, LOUIS T.....Breckenridge
Secretary
SETHRE, ARTHUR E.....Fergus Falls
Arndt, Harry W.....Detroit Lakes
Baker, Jeannette L.....Fergus Falls

§ Baker, Norman H.....Fergus Falls
† Blakey, Adam R.....Osakis
§ Boline, Clifford A.....Battle Lake
† Boysen, Peter.....Bemidji
§ Cain, James H.....Alexandria
§ Campbell, Dennis.....Fergus Falls
§ Carlson, Carl E.....Alexandria

§ Clifford, George W.....Alexandria
†§ Combacker, Leon C.....Fergus Falls
§ Daehlin, Rolf.....Fergus Falls
§ DeKruif, Hendrik.....Fergus Falls
§ Doms, Vernon A.....Elbow Lake
§ Emerson, Edwin E.....Osakis
§ Estrem, Ralph L.....Fergus Falls

COUNTY SOCIETY ROSTER

Estrem, Robert D.....Fergus Falls
Geiser, Peter M.....Alexandria
Hamlon, John S.....Fergus Falls
Hanson, Everett C.....New York Mills
Hanson, LeRoy W.....Bellaire, Texas
Heegaard, William G.....Alexandria
Heiberg, Emmett A.....Fergus Falls
Helseth, Hovald K.....Fergus Falls
Hom, Leong Y. W.....Battle Lake
Hunt, William.....Fergus Falls
Jacobson, Clifford W.....Breckenridge
Kevern, Jay L.....Henning
Kippen, Neil.....Breckenridge
Korda, Henry A.....Pelican Rapids
Larson, Donald M.....Minneapolis
Leibold, Herbert H.....Parkers Prairie

§ Lewis, Arthur J.....Henning
§ Lewis, Charles W.....Henning
§ Love, Frederick A.....Carlos
§ Lund, Carl J.....Fergus Falls
§ Mahowald, Aloys.....Fergus Falls
† Mortenson, Nels G.....Minneapolis
§ Mouritsen, Glenn J.....Fergus Falls
† Naegeli, Frank.....Fergus Falls
Nelson, Roy A.....Fergus Falls
Nelson, Wilburn O. B.....Fergus Falls
§ O'Brien, Louis T.....Breckenridge
Ostergaard, Erling.....Evansville
Parson, E. Lillian B.....Elbow Lake
Parson, Lester R.....Elbow Lake
† Patterson, William L.....Fergus Falls
† Paulson, Theodore S.....Fergus Falls
Perkins, Douglass E.....Alexandria

Reinhardt, James H.....Alexandria
Rockwood, Philo H.....Fergus Falls
Sanderson, David J.....Fergus Falls
† Satersmoen, Theodore.....Pelican Rapids
Sather, Edgar R.....Alexandria
Schaiber, Walter F.....Parkers Prairie
Schoeneberger, P. B.....Perham
Sethre, Arthur E.....Fergus Falls
Shaver, Ward.....Fergus Falls
Stemsrud, Harold L.....Alexandria
† Struxness, David.....Corona, Calif.
Sutton, Harris R.....Hoffman
§ Tanquist, Edwin J.....Alexandria
Warner, James J.....Perham
§ Wasson, Loren F.....Alexandria
† Wray, William E.....Breckenridge

RAMSEY COUNTY MEDICAL SOCIETY

Ramsey County

Regular meetings, last Monday each month except June, July, August.

Annual meeting, last Monday in January

Number of Members—516

President
WILSON, J. ALLEN.....St. Paul
Secretary
GIBBS, EDWARD C.....St. Paul
Executive Secretary
OLSON, MRS. ELEANOR.....St. Paul
Abrams, Alexander, Jr.....St. Paul
Adair, Albert F., Jr.....St. Paul
Ahrens, Albert E.....St. Paul
§ Ahrens, Robert M.....St. Paul
Alden, John F., Jr.....St. Paul
Ambrus, Laszlo.....New York, N. Y.
Amerongen, W. W.....St. Paul
Arnquist, Andrew S.....St. Paul
Arny, Frederick P.....St. Paul
Arzt, Philip K.....St. Paul
Aurelius, J. Richards.....St. Paul
Ausman, Duane R.....St. Paul
Axler, Gueri.....New York
Babb, Frank S.....St. Paul
Bacon, Donald K.....St. Paul
Baer, Walter.....St. Paul
Balcome, Milton M.....St. Paul
Barnett, Joseph M.....St. Paul
Baronofsky, Ivan D.....St. Paul
Barness, Nellis O. N.....St. Paul
Bauer, Eugene L.....St. Paul
§ Beals, Hugh.....LaJolla, Calif.
Beck, Charles J.....North St. Paul
Beech, Raymond H.....St. Paul
Beek, Harvey O.....St. Paul
Beer, John J.....St. Paul
Bell, Charles C.....St. Paul
Bellomo, James.....St. Paul
Bellomo, John.....St. Paul
Benepe, James L.....St. Paul
Benthack, Elaine M.....St. Paul
§ Bentley, Norman P.....St. Paul
Bernier, M. J.....North St. Paul
Bernstein, William C.....St. Paul
Bicek, Joseph F.....St. Paul
Binger, Henry E.....Phoenix, Ariz.
Black, Earl J.....St. Paul
Blumberg, Henry B.....St. Paul
§ Bock, Rolland A.....St. Paul
Bolender, Harold L.....St. Paul
Bonello, Frank J.....St. Paul
Borg, Joseph F.....St. Paul
Bouma, Lewis R.....St. Paul
Bouthilet, Florence J.....St. Paul
Brand, George D.....St. Paul
Bray, Elwyn R.....St. Paul
Briggs, John F.....St. Paul
Broadie, Thomas E.....St. Paul
Brodie, Walter D.....St. Paul
Brown, James E., Jr.....St. Paul
Brown, John C.....Los Gatos, Calif.
Buckley, J. J.....Edina
Bulinski, Theodore J.....St. Paul
Burch, Edward P., II.....St. Paul
Burch, Frank E.....St. Paul
Burklund, Edwin C.....St. Paul
Burlingame, David A.....St. Paul
Burmeister, Richard O.....St. Paul
§ Burns, Robert M.....St. Paul
Burton, Carl G.....St. Paul
§ Bush, Robert P.....Ft. Benning, Ga.
Busher, Herbert H.....St. Paul
Cain, Clark L.....St. Paul
Calin, Stanford H.....St. Paul
Callahan, Francis F.....St. Paul
Cameron, Dale C.....St. Paul
Canine, James L.....So. St. Paul
Carley, Walter A.....St. Paul

Cederleaf, Cherry B.....Mahtomedi
Chadbourne, Charles R.....St. Paul
§ Chatterton, Carl C.....St. Paul
Christensen, Mentor.....St. Paul
§ Christiansen, Andrew.....St. Paul
Clark, Henry B., Jr.....Minneapolis
§ Cochran, Byron B.....St. Paul
Coddon, Walter D.....St. Paul
Cohen, Ellis N.....St. Paul
§ Colby, Woodard L.....St. Paul
Cole, Wallace H.....St. Paul
§ Coleman, John B.....St. Paul
† Collie, Henry G.....St. Petersburg, Fla.
§ Connolly, Coleman J.....St. Paul
Connolly, Joseph P.....St. Paul
Connor, Charles E.....St. Paul
§ Cook, C. Kenneth.....St. Paul
Cooper, Charles C.....St. Paul
† Coseriu, Vasile G.....St. Paul
§ Countryman, Roger S.....St. Paul
§ Craig, David M.....St. Paul
§ Critchfield, Lyman R.....St. Paul
Crowley, James H.....St. Paul
Crudo, Vincent D.....St. Paul
Crump, James W.....St. Paul
Culligan, John M.....St. Paul
Culver, L. G.....St. Paul
Cunningham, E. Dale.....St. Paul
† Davis, Arthur E., Jr.....St. Paul
§ Davis, Edward V.....St. Paul
Dawson, James R.....St. Paul
Decker, Charles H.....St. Paul
§ Derauf, Benjamin I.....St. Paul
Derauf, Donald E.....St. Paul
§ Deters, Donald C.....St. Paul
† Dickson, Thomas H.....St. Paul
§ Drake, Carl B.....St. Paul
Dunn, James N.....St. Paul
Dunn, Robert C.....St. Paul
Dyrdal, Paul J.....St. Paul
§ Earl, George A.....St. Paul
§ Earl, John R.....St. Paul
Edwards, Joseph W.....St. Paul
Edwards, Lloyd G.....St. Paul
§ Edwards, Thomas J.....St. Paul
§ Eginton, Charles T.....St. Paul
† Ely, Orriman S.....So. St. Paul
Emerson, Edward C.....St. Paul
§ Emmons, R. W.....St. Paul
§ Endress, Edward K.....St. Paul
Enroth, Oscar E.....St. Paul
† Ernest, George C. H.....St. Petersburg, Fla.
§ Ersfeld, Murray P.....St. Paul
† Eshelby, E. C.....St. Paul
† Ewens, George B.....St. Paul
Farkas, John V.....St. Paul
Fee, John G.....St. Paul
§ Feinberg, Milton.....St. Paul
Felder, Davitt A.....St. Paul
Felon, Arthur J.....St. Paul
§ Fesler, Harold H.....St. Paul
Field, Anthony H.....Farmington
§ Fink, Daniel L.....St. Paul
§ Fischer, Robert F.....St. Paul
§ Fisher, Dan W.....St. Paul
§ Flanagan, Harold F.....St. Paul
§ Flannery, Hubert F.....St. Paul
§ Flynn, Reynold P.....St. Paul
§ Flynn, L. L., Jr.....St. Paul
† Fogarty, Charles W.....St. Paul
§ Fogarty, Charles W., Jr.....St. Paul
§ Fogelberg, Emil J.....St. Paul
§ Foley, Frederic E. B.....St. Paul
Forsythe, James R.....St. Paul
§ Fox, LeRoy J.....St. Paul

Freeman, Charles D., Jr.....St. Paul
§ Freeman, Gerald I.....St. Paul
Freidman, Louis L.....St. Paul
Fritz, Wallace L.....St. Paul
Froats, Charles W.....St. Paul
§ Fuller, Benjamin F.....St. Paul
Galligan, John J.....St. Paul
Garbrecht, Arthur W.....St. Paul
Gardner, Walter P.....St. Paul
Garrow, Douglas M.....St. Paul
§ Gehlen, Joseph N.....St. Paul
Gibbs, Edward C.....St. Paul
§ Gillespie, Delmar R.....St. Paul
Gilsdorf, Donald A.....St. Paul
Gleason, Wallace A.....St. Paul
Goldsmith, Joseph W.....St. Paul
† Goltz, Edward V.....St. Paul
Grant, Hendrie W.....St. Paul
† Gratzek, Thomas.....St. Paul
§ Grau, R. K.....White Bear Lake
Gray, Edward F.....St. Paul
Hagen, Paul S.....St. Paul
Hakanson, Erick Y.....St. Paul
Hall, Barnard.....St. Paul
Hammes, Ernest M.....St. Paul
Hammes, Ernest M., Jr.....St. Paul
Hannon, Donald W.....St. Paul
Harbaugh, John T.....Bloomington, Ill.
Harmon, Gaius E.....St. Paul
Hartfiel, William F.....St. Paul
Hartley, Marjorie.....St. Paul
† Hartley, Everett C.....St. Paul
Hauser, Victor P.....St. Paul
Hayes, Albert F.....St. Paul
Heck, William W.....St. Paul
Hedenstrom, Frank G.....St. Paul
Heilig, William R.....St. Paul
Henderson, Arthur J. G.....No. St. Paul
Hengstler, William H.....St. Paul
Hensel, Charles N.....St. Paul
Herman, Samuel M.....St. Paul
Herrmann, Edgar T.....St. Paul
Hertz, Myron J.....St. Paul
† Hilger, Andrew W.....St. Paul
Hilger, Jerome A.....St. Paul
Hilger, Laurence D.....St. Paul
§ Hiker, Marcus D.....St. Paul
Hiniker, Louis P.....St. Paul
§ Hochfilzer, John J.....St. Paul
Hodgson, Jane E.....St. Paul
† Holcomb, O. William.....St. Paul
Hollinshead, W. H.....St. Paul
Holmen, Robert W.....St. Paul
Holt, John E.....St. Paul
Hopkins, G. Wendell.....St. Paul
Howard, Merrill A.....St. Paul
Howe, Newell W.....St. Paul
Hullsiek, Harold E.....St. Paul
Hullsiek, Richard B.....Fort Snelling
Hunter, Murray H.....Farmington
Hurwitz, Milton M.....St. Paul
Husebye, Kjeld O.....St. Paul
† Ide, Arthur W.....White Bear Lake
Ikeda, Kano.....St. Paul
† Ingerson, Carl A.....St. Paul
Jackson, William C.....St. Paul
James, Ellery M.....St. Paul
James, John W.....St. Paul
Janssen, Martin E.....St. Paul
Jarvis, Bruce W.....St. Paul
Jarvis, Charles W.....St. Paul
Jarvis, Marilyn A.....St. Paul
Jastram, Rupert M.....St. Paul
† Jesion, Joseph W.....Pine River
Johanson, Waldemar G.....St. Paul

COUNTY SOCIETY ROSTER

§ Johnson, Carl E. St. Paul
 Johnson, Carolyn A. St. Paul
 Johnson, Herbert W. St. Paul
 Johnson, R. J. St. Paul
 † Jones, E. Mendelsohn St. Paul
 Kamman, Gordon R. St. Paul
 Kaplan, David H. St. Paul
 Karon, Irvine M. St. Paul
 Kasper, Eugene M. St. Paul
 Katz, Louis J. Long Beach, Calif.
 Keefe, Rolland E. St. Paul
 Kelly, Albert C. St. Paul
 Kelly, Edward H. St. Paul
 Kelly, James H. St. Paul
 † Kelly, John V. St. Paul
 Kelsey, Chauncey M. St. Paul
 Kenefick, Emmett V. St. Paul
 Kenyon, Thomas J. St. Paul
 Kesting, Herman St. Paul
 † King, George L. Hudson, Wisc.
 † Klein, Henry N. St. Paul
 Knutson, Gerhard E. St. Paul
 Knutson, Robert C. St. Paul
 Kodres, Nina St. Paul
 Koza, Donald W. St. Paul
 Krezowski, Thomas K. St. Paul
 Kugler, Alex A. St. Paul
 Kuske, Albert W. St. Paul
 Kusske, Bradley W. St. Paul
 Kusske, Douglas R. St. Paul
 Kvitrud, Gilbert St. Paul
 Lannin, Bernard G. St. Paul
 Lannin, Donald R. St. Paul
 Larrabee, Walter F., Jr. St. Paul
 Larson, Eva-Jane Ostergren St. Paul
 Larson, James T. So. St. Paul
 Larson, Kenneth R. St. Paul
 Larson, Martin L. St. Paul
 Laszewski, Franz von Zelberschwecht St. Paul
 Lax, Morris H. St. Paul
 † Leahy, Bartholomew St. Paul
 Leavenworth, Richard O. St. Paul
 Leick, Richard M. St. Paul
 Leitch, Archibald St. Paul
 Lepak, John A. St. Paul
 Lerche, William Cable, Wisc.
 Leven, N. Logan St. Paul
 Leverenz, Carleton W. St. Paul
 Levitt, George X. St. Paul
 Lick, Charles L. St. Paul
 Lick, Louis C. St. Paul
 Lick, William J., Jr. St. Paul
 Lien, Richard J. St. Paul
 Lightbourn, Edgar L. Hastings
 Lilleberg, Norbert J. St. Paul
 Lindell, Robert St. Paul
 Lippman, Hyman S. St. Paul
 Litkewitsch, Helene St. Paul
 Loken, Selmer M. St. Paul
 Lowe, Earl R. So. St. Paul
 Lowe, Thomas A. So. St. Paul
 Lundholm, Arthur M. St. Paul
 Lynch, Francis W. St. Paul
 McCabe, James S. St. Paul
 McCain, Donovan L. St. Paul
 McCarthy, Joseph J. St. Paul
 † McClanahan, James H. White Bear Lake
 McClanahan, Thomas S. White Bear Lake
 McClellan, Robert J. Unknown
 McCloud, Charles N., Jr. St. Paul
 McDaniel, S. P. Lakeville
 McEwan, Alexander St. Paul
 McGroarty, Brian J. St. Paul
 McKenzie, Eva E. St. Paul
 McNeill, J. A. St. Paul
 Mackoff, Sam M. Unknown
 Madland, Robert S. St. Paul
 Malerich, J. Anthony St. Paul
 Malerich, J. Anthony, Jr. St. Paul
 Manlove, Charles H., Jr. St. Paul
 Mark, Hilbert St. Paul
 Marks, Roger W. St. Paul
 Martin, Dwight L. St. Paul
 Martineau, Joseph L. St. Paul
 Mateo, Guillermo St. Paul
 Matthews, James H. Minneapolis
 Mazzitello, William F. St. Paul
 Meade, John R. St. Paul
 Mears, Burtis J. St. Paul
 Medelman, John P. St. Paul
 Melancon, Joseph F. St. Paul
 Menold, William F. St. Paul
 Merner, Thomas B. Faribault
 Merrick, Robert L. St. Paul
 † Meyerding, Edward A. St. Paul
 Michienzi, Leonard J. St. Paul
 Midboe, Gilbert St. Paul
 Miller, Albert G. St. Paul
 Miller, William T. Minneapolis
 Miller, Z. R. St. Paul

Milnar, Frank J. St. Paul
 Mishek, Charles J. St. Paul
 Moga, John A. St. Paul
 Molander, Herbert A. St. Paul
 Monahan, Robert H. St. Paul
 Mooney, Robert D. St. Paul
 Moquin, Marie A. St. Paul
 † Moren, J. Adelaide White Bear Lake
 Moriarty, Berenice St. Paul
 Moriarty, Cecile R. St. Paul
 Muller, A. Eugene No. St. Paul
 Mundahl, Harold R. St. Paul
 Murphy, Jack T. St. Paul
 Nash, Leo A. St. Paul
 Neibergs, Lidija St. Paul
 Neibergs, Pauls St. Paul
 Nelson, Loren E. St. Paul
 † Nelson, Louis A. St. Paul
 Nelson, Louis A., Jr. St. Paul
 Nimlos, Kenneth O. St. Paul
 † Nimlos, Lenore O. St. Paul
 Noble, John F. St. Paul
 Noble, J. Lawrence St. Paul
 Norman, David D. St. Paul
 Nuebel, Charles J. St. Paul
 Nye, Katherine A. St. Paul
 Nye, Lillian L. St. Paul
 O'Brien, J. C. St. Paul
 † O'Connor, Loren J. St. Paul
 O'Kane, Thomas W. St. Paul
 O'Malley, Valentine St. Paul
 O'Reilly, Bernard E. St. Paul
 Ockuly, Orville St. Paul
 Ogden, Warner St. Paul
 † Ohage, Justus St. Paul
 Olsen, Ralph L. St. Paul
 Olson, Charles A. St. Paul
 Ostergren, Edward W. St. Paul
 Ouellette, Alfred J. St. Paul
 Owens, Frederick M., Jr. St. Paul
 Palm, Neil M. St. Paul
 Paulson, Elmer C. St. Paul
 Paulson, Wallace J. Minneapolis
 Pearson, Fritz R. St. Paul
 Pearson, Malcolm M. St. Paul
 Peck, Willard R. St. Paul
 Pedersen, Arthur H. St. Paul
 Peterson, David B. St. Paul
 Peterson, Donald H. St. Paul
 Peterson, Edward A. St. Paul
 Peterson, Harold O. St. Paul
 Peterson, Joel L. E. St. Paul
 Peterson, Roy L. White Bear Lake
 † Plondke, Fred J. White Bear Lake
 Plotke, Harry L. St. Paul
 Polski, Paul G. So. St. Paul
 Post, Edmund A. St. Paul
 Proud, Harry S. St. Paul
 Quattlebaum, Frank W. St. Paul
 Ralph, James R. St. Paul
 Ramlow, Ralph M. St. Paul
 † Ramsey, Walter R. St. Paul
 Rasmussen, Ramby C. St. Paul
 Ravits, Harold G. St. Paul
 Rea, Charles E. St. Paul
 † Reeves, Melvin M. Portland, Ore.
 Reid, James W. So. St. Paul
 Reif, Robert W. White Bear Lake
 Richards, Albert M. St. Paul
 Richards, Ernest T. F. St. Paul
 Richardson, Edward J., Jr. St. Paul
 Richardson, Robert J. St. Paul
 Rick, Paul F. W. St. Paul
 Rinkey, Eugene St. Paul
 Ritchie, Wallace P. St. Paul
 Ritt, Albert E. St. Paul
 Roach, Donald E. St. Paul
 Rogers, Sydney F. St. Paul
 Rolig, David H. St. Paul
 Rollie, Orris O. St. Paul
 Rosenthal, Robert St. Paul
 Roth, George C. St. Paul
 † Rothschild, Harold J. St. Paul
 Rowe, Clarence J., Jr. St. Paul
 Roy, Phil C. St. Paul
 † Rubberg, George N. Santa Barbara, Calif.
 Rusterholz, Alan P. St. Paul
 Ryan, John J. St. Paul
 Ryan, Joseph M. St. Paul
 Sarnecki, M. M. St. Paul
 † Satterlund, Victor L. New Richmond, Wisc.
 † Savage, Francis J. St. Paul
 Schmidtke, Reinhardt L. St. Paul
 † Schoch, Robert B. J. St. Paul
 Schons, Edward St. Paul
 Schroeckenstein, Hugo F. St. Paul
 † Schultz, Frederick C. St. Paul
 † Schulze, Albert G. St. Paul

Schwyzzer, Hanns C. St. Paul
 Schwyzzer, Marguerite St. Paul
 Scott, Eugene E. St. Paul
 Sekhon, Mohan S. St. Paul
 Sells, Richard J. No. St. Paul
 Setzer, Robert J. St. Paul
 Shannon, William R. St. Paul
 Shelandar, Marcus I. St. Paul
 † Shellman, John L. Pacific Palisades, Calif.
 Short, Jacob St. Paul
 Siegel, Clarence St. Paul
 Simons, Leander T. St. Paul
 Singer, Benjamin J. St. Paul
 Skinner, Abbott St. Paul
 Skinner, Harvey O. St. Paul
 Skworcow, George St. Paul
 Smisek, Elmer A. St. Paul
 Smith, Ralph E. Minneapolis
 Smith, Vernon D. E. St. Paul
 Snyder, George William St. Paul
 Sohlberg, Olof I. St. Paul
 Sommerdorf, Vernon L. St. Paul
 Sommers, Ben St. Paul
 Sorem, Milton B. St. Paul
 Soucheray, Philip H. St. Paul
 Souster, Benjamin B. St. Paul
 Sowada, Ernest J. St. Paul
 Sprafka, Gregory St. Paul
 Sprafka, Joseph L. St. Paul
 Sprafka, Joseph M. St. Paul
 Steinberg, Charles L. St. Paul
 Sterner, Donald C. St. Paul
 Sterner, E. R. St. Paul
 Sterner, John J. St. Paul
 Stewart, Alexander St. Paul
 Stolpestad, Armer H. St. Paul
 Stolpestad, Herbert L. St. Paul
 Strand, Jack W. St. Paul
 Strate, Gordon E. St. Paul
 Straus, M. L. St. Paul
 Strem, Edward L. St. Paul
 Sturley, Rodney F. St. Paul
 Swanson, John A. St. Paul
 Swanson, Lawrence J. St. Paul
 Swendsen, James J. St. Paul
 Swenson, Donald B. St. Paul
 Tani, George St. Paul
 Teisberg, John E. St. Paul
 Testor, James V. Minneapolis
 Thompson, Floyd A. St. Paul
 Thoreson, M. C. Bernice So. St. Paul
 Tift, Cyril R. St. Paul
 Tongen, Lyle A. St. Paul
 † Tracht, Robert R. St. Paul
 Travis, James S. St. Paul
 Tregilgas, Harold R. So. St. Paul
 Tregilgas, Richard B. St. Paul
 Ubel, Frank A. St. Paul
 Van Bergen, Frederick H. Minneapolis
 Varco, Richard L. St. Paul
 Veirs, Dean M. St. Paul
 Veirs, Ruby J. S. St. Paul
 Venables, Alexander E. St. Paul
 Waas, Charles W. St. Paul
 Walker, Arthur E. St. Paul
 Wall, James O. St. Paul
 Wallinga, Jack St. Paul
 Walsh, Edward F. St. Paul
 Walter, Clarence W. St. Paul
 Warren, Cecil A. St. Paul
 Watson, P. Theodore St. Paul
 Watson, William H. A. St. Paul
 Watson, William J. Newport
 Watz, Clarence E. St. Paul
 Webber, Fred L. St. Paul
 Wedes, Deno J. St. Paul
 Weis, Benjamin A. St. Paul
 Weisberg, Maurice St. Paul
 Wenzel, Gilbert P. St. Paul
 Westover, D. E. St. Paul
 Wetteland, Thomas F. W. St. Paul
 Wetzel, Earl V. St. Paul
 Williams, Arthur B. St. Paul
 Williams, Clayton K. St. Paul
 Williams, George E. St. Paul
 Williams, John A. St. Paul
 Williams, Richard A. St. Paul Park
 Wilson, J. Allen St. Paul
 Wilson, James V. St. Paul
 Winnick, Joseph B. St. Paul
 Witthaus, Melvyn E. St. Paul
 † Wolff, Herman J. St. Paul
 Wolfkoff, H. J. St. Paul
 Word, Harlan L. St. Paul
 Youngren, Everett R. St. Paul
 Zachman, Leo L. St. Paul
 Zagaria, James F. St. Paul
 Zimmermann, Bernard D. St. Paul
 † Zimmermann, Harry B. St. Paul

COUNTY SOCIETY ROSTER

RED RIVER VALLEY MEDICAL SOCIETY

Kittson, Mahnomen, Marshall, Norman, Pennington, Polk, Red Lake and Roseau Counties

Regular meetings, quarterly. Annual meeting, December

Number of Members—55

<i>President</i>	
ANDERSON, WALLACE E.....	Clearbrook
<i>Secretary</i>	
SATHER, RUSSELL O.....	Crookston
Anderson, Wallace E.....	
Behr, Orla K.....	Crookston
Berg, Arnold M.....	Roseau
Berge, David O.....	Roseau
Biedermann, Jacob.....	Thief River Falls
Boyer, George S.....	Crookston
Bratrud, Edward.....	Thief River Falls
Brink, Adlai A.....	Baudette
Cameron, John H.....	Crookston
Clapp, Hubert D.....	Crookston
Dale, Lester N.....	Red Lake Falls
Delmore, John L.....	Roseau
Delmore, John L., Jr.....	Roseau
Delmore, Robert J.....	New Orleans, La.
Erickson, Eskil.....	Halstad

§ Feigal, William M.....	Thief River Falls
Flancher, Leon H.....	Crookston
Greene, Daniel E.....	Thief River Falls
§ Hirsh, Stanton A.....	Crookston
† Hollands, William H.....	Fisher
§ Holmstrom, Carl H.....	Warren
§ Janecky, Allen G.....	Baudette
§ Jensen, John A.....	Crookston
§ Kinkade, Byron R.....	Ada
§ Klefstad, Lloyd H.....	Greenbush
§ Kostick, William R.....	Fertile
§ Loken, Theodore.....	Ada
§ McKaig, Alan M.....	Red Lake Falls
§ Martin, George B.....	Thief River Falls
§ Mercil, William F.....	Crookston
§ Mueller, Donald R.....	Bagley
§ Nelson, Henry E.....	Crookston
§ Nelson, Kenneth L.....	Warroad
§ Nord, J. Erling.....	Hallock
§ Oppegard, Chester L.....	Crookston

§ Parker, Philip J.....	Unknown
§ Pumala, Erven E.....	Warren
§ Reff, Alan R.....	Crookston
§ Roholt, Christian.....	McIntosh
§ Sather, Edgar L.....	Fosston
§ Sather, George A.....	Fosston
§ Sather, Richard N.....	Fosston
§ Sather, Russell O.....	Crookston
§ Schossow, George W.....	Erskine
§ Skogerboe, Rudolph B.....	Karlstad
§ Stadem, Clifford J.....	Twin Valley
§ Starekow, Milton D.....	Thief River Falls
§ Stensgaard, Kermit L.....	Thief River Falls
§ Stewart, Donald E.....	Crookston
§ Thysell, Harold R.....	Crookston
§ Uhley, Charles G.....	Crookston
§ Van Rooy, George T.....	Thief River Falls
§ Wendt, H. Paul.....	Thief River Falls
§ Wikoff, Howard M.....	Crookston
† Wilttrout, Irving G.....	Oslo

RENVILLE-REDWOOD COUNTY MEDICAL SOCIETY

Renville and Redwood Counties

Regular meetings, third Tuesday of each month. Annual meeting, December

Number of Members—28

<i>President</i>	
DIESSNER, ARDELL W.....	Redwood Falls
<i>Secretary</i>	
METZ, DONALD D.....	Buffalo Lake
Alcorn, William J.....	
Alton, Donald G.....	Bird Island
Anderson, Chester A.....	Hector
Bessesen, Daniel H.....	Olivia
Billings, Ralph E.....	Franklin
Brand, William A.....	Redwood Falls

§ Ceplecha, Stanley F.....	Redwood Falls
§ Cosgriff, James A.....	Olivia
§ Cosgriff, James A., Jr.....	Olivia
§ Diessner, Ardell W.....	Redwood Falls
§ Dordal, John.....	Sacred Heart
§ Fawcett, Arthur M.....	Renville
§ Flinn, James B.....	Redwood Falls
§ Flinn, Thomas E.....	Remer
† Furr, Leo O.....	St. Paul
§ Haas, Jack F.....	Fairfax
§ Hinderaker, Harris P.....	Bird Island

§ Inglis, William.....	Redwood Falls
§ Johnson, Orville H.....	Edina
§ Johnson, William E.....	Morgan
§ Knoche, Harvey A.....	Morgan
§ Lenz, Joseph R.....	Morton
† Mesker, George H.....	Olivia
§ Metz, Donald D.....	Buffalo Lake
§ Nelson, Glenn B.....	Fairfax
§ Pierce, Robert B.....	Renville
† Preisinger, Joseph W.....	Dallas, Texas
§ Strauchler, Jonas.....	Belview

RICE COUNTY MEDICAL SOCIETY

Rice County

Regular meetings, third Tuesday of each month. Annual meeting, third Tuesday in October

Number of Members—39

<i>President</i>	
NIELSEN, ALVIN M.....	Northfield
<i>Secretary</i>	
FURLOW, WILLIAM L.....	Faribault
Bauer, Paul G.....	
Beaton, J. Gordon.....	Northfield
Brühl, Heinz H.....	Faribault
§ Buesgens, Ralph H.....	Waterville
† Dungay, Neil S.....	Northfield
§ Engberg, Edward J.....	Faribault
§ Francis, David W.....	Morristown
§ Furlow, William L.....	Faribault
† Hanson, Adolph M.....	Faribault
§ Hanson, John W.....	Northfield

† Huxley, Frederick R.....	Faribault
§ Kennedy, George L.....	Faribault
§ Kolars, James J.....	Faribault
† Kucera, Louis B.....	Colorado Springs, Colorado
§ Larson, W. G.....	Northfield
§ Lende, Norman.....	Faribault
† Lexa, F. J.....	Lonsdale
§ Mears, Robert F.....	Northfield
§ Meyer, Frederick C.....	Kenyon
§ Meyer, Paul F.....	Faribault
§ Meyer, Robert P.....	Faribault
§ Moses, Royal R.....	Kenyon
§ Nelson, Ernest J.....	Lonsdale
§ Nielsen, Alvin M.....	Northfield

§ Neutzman, Arthur W.....	Faribault
§ Orr, Burton A.....	Faribault
§ Ozolins, Marta.....	Faribault
§ Pasek, Edward A.....	Faribault
§ Petersen, Donald H.....	Northfield
§ Robilliard, Charles M.....	Faribault
§ Rumpf, Carl W.....	Faribault
§ Rysgaard, George M.....	Northfield
§ Smith, Thorsten.....	Faribault
§ Stevenson, Frank W.....	Faribault
§ Street, Bernard.....	Northfield
§ Studer, Donald J.....	Faribault
§ Traeger, Carl A.....	Faribault
§ Weaver, Paul H.....	Faribault
§ Wilson, Warren B.....	Northfield

ST. LOUIS COUNTY MEDICAL SOCIETY

Carlton, Cook, Itasca, Lake and St. Louis Counties

Regular meetings, second Thursday except July and August.

Annual meeting, second Thursday in January

Number of Members—293

<i>President</i>	
BARRETT, EARL E.....	Duluth
<i>Secretary</i>	
BERGAN, ROBERT O.....	Duluth
<i>Executive Secretary</i>	
MRS. MARGARET B. GILBERT.....	Duluth
Abraham, Arden L.....	
§ Adams, Bertram S.....	Hibbing
§ Addy, Edward R.....	Gilbert
§ Ahola, Kenneth E.....	Hibbing
§ Ahrens, Curtis F.....	Duluth
§ Allison, David D.....	Litchfield
§ Alpert, Abraham H.....	Virginia
§ Andrew, William F.....	Duluth
§ Antonow, Arthur M.....	Virginia

§ Asta, Joseph J.....	Duluth
§ Athens, Alvin G.....	Duluth
§ Amore, William G.....	Duluth
§ Auferheide, Arthur C.....	Duluth
§ Backus, Reno W.....	Nopeming
§ Bagley, Charles M.....	Duluth
§ Bagley, Elizabeth C.....	Duluth
§ Bagley, William R.....	Duluth
§ Baich, Velemir M.....	Coleraine
§ Bakkila, Henry E.....	Duluth
§ Balmer, Albert I.....	Duluth
§ Bardson, Richard.....	Duluth
§ Barker, John D.....	Duluth
§ Barnes, Richard E.....	Aurora
† Barney, Leon A.....	Duluth
§ Barrett, Earl E.....	Duluth

§ Bartzén, Peter J.....	Duluth
§ Becker, Frederick T.....	Duluth
§ Benell, Otto E.....	Virginia
§ Bepko, Marie K.....	Cloquet
§ Berdez, George L.....	Duluth
§ Bergan, Robert O.....	Duluth
§ Bianco, Anthony J.....	Duluth
† Bianco, Anthony J., Jr.....	Rochester
† Binet, Henry E.....	Grand Rapids
§ Blackmore, Sidney C.....	Biwabik
§ Bloom, Joseph.....	Silver Bay
§ Bolz, J. Arnold.....	Grand Rapids
§ Boman, Paul G.....	Duluth
§ Bonner, John L.....	Eveleth
§ Bouchelle, McLemore.....	Virginia
§ Bowen, Robert L.....	Hibbing

COUNTY SOCIETY ROSTER

†§Boyea, Lyle H.....Man, West Virginia
 Boyer, Sam H., Jr.....Duluth
 Braun, Ohrmundt C.....Grand Rapids
 Bray, Philip N.....Duluth
 Brockway, Roger W.....Grand Rapids
 Brooker, Warren J.....Duluth
 Brown, Cyrus C., Jr.....Duluth
 Buchanan, Gerald S.....Ithaca, Mich.
 Buckley, Robert P.....Duluth
 †Burleigh, Edward G.....Eveleth
 Butler, John K.....Cloquet
 Callan, Joseph A.....Virginia
 Cantwell, William F.....International Falls
 Chermak, Francis G.....International Falls
 Chittum, John R.....Aurora
 Christensen, Clarence H.....Duluth
 Ciriacy, Edward W.....Ely
 Clark, Clarence L.....Duluth
 Clark, Elizabeth A.....Duluth
 Clark, Ivan T.....Duluth
 Coll, James J.....Duluth
 Collins, Arthur N.....Duluth
 Conley, Francis W.....Duluth
 Cope, Herschel E.....Virginia
 Coventry, William D.....Duluth
 Cowan, George M.....Duluth
 Detjen, Edward D.....Bigfork
 Dickson, Franklin H., Jr.....Proctor
 Dobler, Manfred G.....Ely
 †Doxsee, George C.....Iowa City, Iowa
 Dwyer, John J.....Duluth
 Eckman, Philip F.....Duluth
 Eckman, Ralph J.....Duluth
 Eisman, Walter.....Hibbing
 Ekblad, John W.....Rock Island, Ill.
 Eklund, Carl D.....Duluth
 Elias, Frank J.....Duluth
 Emanuel, Karl W.....Duluth
 Eppard, Raymond M.....Cloquet
 Erickson, George P.....Hibbing
 Erickson, Vernon D.....Grand Rapids
 Erskine, Gordon M.....Grand Rapids
 Evenstad, John B.....Grand Rapids
 Fawcett, Keith R.....Duluth
 Fellows, Manley F.....Duluth
 Ferrand, Paula T.....Moose Lake
 Ferrell, Clarence R.....Grand Rapids
 Feuling, John C.....Duluth
 Fifield, Malcolm M.....Duluth
 Fischer, Mario McC.....Duluth
 Fisketti, Henry.....Duluth
 Flynn, Bernard F.....Hibbing
 §Fredericks, Merriam G.....Duluth
 French, Bayard T.....Hibbing
 Fuller, Josiah.....Duluth
 Gillespie, Malcolm G.....Duluth
 Goldish, Daniel R.....Duluth
 Goldish, Robert J.....Duluth
 Goldschmidt, Volker.....Duluth
 Goodman, Charles E.....Virginia
 Goodnow, William E.....Duluth
 Gowan, Lawrence R.....Duluth
 §Graham, Archibald W.....Chisholm
 Grahek, Jack P.....Ely
 Granquist, Richard D.....Coleraine
 Grinley, Andrew V.....Grand Rapids
 Grohs, William H.....Duluth
 Haavik, John E.....Duluth
 Halbert, John J.....Duluth
 Halliday, Phillip V.....Duluth
 Halper, Bernard.....Hibbing
 †Haney, Claude L.....Duluth
 Hansen, Robert E.....Hibbing
 Hanson, Ernest O.....Cloquet
 Harrington, Vernon A., Jr.....Duluth
 †Harris, Carl N.....Hibbing
 †Hatch, Walter E.....Duluth
 §Hedberg, Gustaf A.....Nopeming
 Heiam, William C.....Cook
 Hilding, Anderson C.....Duluth
 †Hill, Frederick E.....Riverside, Calif.
 †Hill, John P.....Chicago, Ill.
 †Hirschboeck, Frank J.....Duluth
 Hoff, Herbert O.....Duluth

†§Hoover, Norman W.....Rochester
 Houkom, Samuel S.....Duluth
 Hutchinson, Henry.....Moose Lake
 †Indihar, John E.....Minneapolis
 Ireland, Gerald W.....Nashauk
 Jacobson, Clarence.....Chisholm
 Jacobson, Ferdinand C.....Duluth
 Jensen, Thorvald J.....Duluth
 Jeronimus, Henry J.....Duluth
 Jessico, Charles M.....Duluth
 Joffe, Harold H.....Virginia
 Johnsen, Henry A., Jr.....Edina
 †Johnson, Edward A.....St. Paul
 Johnson, Karl E.....Duluth
 Johnsrud, Luverne W.....Hibbing
 Johnston, Henry W.....Virginia
 †Johnston, Rufus O.....Gainesville, Fla.
 Jolin, Francis M.....Grand Rapids
 Juntunen, Roy R.....Duluth
 Karges, Laurel E.....Grand Rapids
 Kelley, Walter M.....Duluth
 Kelly, Robert T.....Nashauk
 Klein, Harry.....Duluth
 Klein, William A.....Duluth
 Knapp, Frank N.....Duluth
 Knoedler, John P.....Duluth
 Knutson, Kenneth R.....Hibbing
 Kohlbry, Carl O.....Duluth
 Kosiak, William.....Two Harbors
 †Kotchevar, Frank R.....Eveleth
 Kozberg, Oscar.....Moose Lake
 †Krueger, Victor R.....Nopeming
 Kruger, Elmer L., Jr.....Nashauk
 †LaBree, Robert H.....Duluth
 †Laird, Arthur T.....Duluth
 Larson, Keith D.....Moose Lake
 Latterell, Kenneth E.....Duluth
 Law, Harrison E.....Virginia
 Leek, Joseph H.....Duluth
 Lepak, Francis J.....Duluth
 Leppo, N. Erkki A.....Duluth
 L'Esperance Bernard F.....Two Harbors
 †Lipinski, Stanley W.....Memphis, Tenn.
 Litman, Samuel N.....Duluth
 †McCarty, Paul D.....Tower
 †McCoy, Mary K.....Duluth
 †McDonald, Archibald L.....Unknown
 †McDonald, Owen G.....Duluth
 McHaffie, Orval L.....Duluth
 McKenna, John J.....Virginia
 McKenna, Maurice J.....Grand Rapids
 McNutt, John R.....Duluth
 MacRae, Gordon C.....Duluth
 Magney, Fredolph H.....Duluth
 Malmstrom, John A.....Virginia
 Marrone, Patrick H.....Duluth
 Martin, Webster C.....Duluth
 Martin, William B.....Duluth
 Mast, Frederic L.....Chisholm
 Mayne, Roy M.....Nopeming
 †Mead, Charles H.....Duluth
 Merriman, Lloyd L.....Duluth
 Miettunen, John B.....Chisholm
 Milroy, Thomas W.....Virginia
 Moe, Thomas.....Moose Lake
 Moehring, Henry G.....Duluth
 Mollers, Theodore P.....Soudan
 Monserud, Nels O.....Cloquet
 Morsman, L. William.....Hibbing
 Moyer, John B.....Duluth
 Moyer, Ralph D.....Two Harbors
 Munson, Martin S.....Barnum
 Murn, Thomas G.....Chisholm
 Murray, Robert A.....Hibbing
 Nakamura, James Y.....Deer River
 Neff, Walter S.....Virginia
 Nicholson, Murdoch A.....Duluth
 Nisius, George F.....Duluth
 Nollet, Donald J.....Hibbing
 Norberg, Carl E.....Cloquet
 Nutting, Roland E.....Duluth
 O'Neill, John C.....Duluth
 Olson, Albert E.....Duluth
 Olson, Archie O.....Duluth

Owens, Ben P.....Hibbing
 Paciotti, Vincent J.....Hibbing
 Papermaster, Ralph.....Two Harbors
 Parson, E. Irvine.....Duluth
 Pask, Antone W.....Cloquet
 Patch, Orien B.....Duluth
 Payne, Richard E.....Virginia
 Pearsall, R. P.....Virginia
 Pedersen, Roy C.....Duluth
 †Pennie, Daniel F. V.....Duluth
 Peterson, Edward N.....Virginia
 Peterson, John H.....Duluth
 Pierce, Jack R.....Pikeville, Ky.
 Power, John E.....Duluth
 Power, John E., Jr.....Duluth
 Puumala, Reino H.....Cloquet
 †Raadquist, Charles S.....Hibbing
 Raattama, John W.....Nashauk
 Rajala, Arnold I.....Grand Rapids
 Reed, Paul.....Virginia
 Richter, David J.....Virginia
 Rowe, Olin W.....Duluth
 Rowles, Everett K.....Coleraine
 Rudie, Peter S.....Duluth
 Rudie, William D.....Duluth
 Runquist, John M.....Duluth
 Ryan, William J.....Duluth
 Sach-Rowitz, Alvan.....Moose Lake
 Salter, Reginald A.....Virginia
 Sanford, John B.....Chicago, Ill.
 Sarff, Oliver E.....Duluth
 Sax, Milton H.....Duluth
 Sax, Simon G.....Duluth
 Schirber, Martin J.....Grand Rapids
 Schmid, John F.....Duluth
 Schneider, Lawrence E.....Duluth
 Schroder, Charles H. Pottstown, Penn.
 Schweiger, Theodore R.....Hibbing
 Seashore, Rosel T.....Duluth
 Sekanina, Jan.....Babbitt
 Sher, David A.....Virginia
 Shirai, Shohei.....Fort Harrison, Indiana
 Siegel, John S.....Virginia
 Sinamark, Andrew.....Hibbing
 Sisler, Clifford E.....Grand Rapids
 Smith, Cyril M.....Duluth
 Smith, Wallace R.....Grand Marais
 Snyder, Omer E.....Ely
 Spang, Anthony J.....Duluth
 Spang, James S.....Duluth
 Spang, William M.....Duluth
 Stein, William A.....Ely
 Storsteen, Kenneth A.....Duluth
 †Strathern, Moses L.....Gilbert
 Streitz, John M.....Duluth
 Strewler, Gordon J.....Duluth
 Strobil, William G.....Duluth
 Sutherland, Harry N.....Ely
 Swedberg, William A.....Duluth
 Swenson, Arnold O.....Duluth
 Swenson, Richard W.....Hibbing
 Teich, Kenneth W.....Duluth
 Terrell, Bernard J.....Nopeming
 Tellie, James P.....Duluth
 Thomas, John V.....Duluth
 Thoun, Laurence G.....Hibbing
 Tomhave, Wesley G.....Hibbing
 Tosseland, Noel E.....Duluth
 †Tuohy, Edward L.....Santa Barbara, Calif.
 Tuura, James L.....Duluth
 Urberg, Sofus E.....Duluth
 Van Ryzin, Donald J.....Duluth
 †Walder, Harold J.....Duluth
 †Walker, Alfred E.....St. Paul
 Wallace, Martin O.....Duluth
 Walter, Frederick H.....International Falls
 Wells, Arthur H.....Duluth
 Wheeler, Daniel W.....Duluth
 Williams, Bruce F. P.....Duluth
 †Winter, John A.....Duluth
 †§Wolff, John M.....Duluth
 Woodruff, Whitney.....Virginia
 †Young, Thomas O.....Duluth
 §Zemmers, Roberts.....Duluth

SCOTT-CARVER COUNTY MEDICAL SOCIETY

Scott and Carver Counties

Regular meetings, third Wednesday of every month, except July and August.

Annual meeting, third Wednesday in June

Number of Members—33

President
 HEINZ, LAWRENCE H.....Shakopee
 Secretary
 CLARKE, JOHN W.....Watertown
 Bean, Charles N.....Waconia
 Bratholdt, James W.....Watertown

† Buck, Frederick H.....Shakopee
 Cervenka, Charles F.....New Prague
 Clarke, John W.....Watertown
 Doherty, Elmer M.....New Prague
 Hanson, Daniel J.....Chaska
 Hebeisen, Milton B.....Carver
 Heinz, Ivy B.....Shakopee
 Heinz, Lawrence H.....Shakopee

§ Heinzerling, Carl R.....Chaska
 Juergens, Herman M.....Belle Plaine
 Kucera, Stanley T.....Northfield
 Larson, Leighton W.....Waconia
 Lukk, Olaf.....Montgomery
 † Martin, Thomas Philip.....Arlington
 Nagel, Harold D.....Minneapolis

COUNTY SOCIETY ROSTER

Ninneman, Newton N.....Waconia
 † Novak, Edward E.....New Prague
 Olson, Chester J.....Belle Plaine
 Pearson, Bror F.....Shakopee
 Philp, David R.....Watertown

Pogue, Richard E.....Carson City, Nevada
 § Ponterio, James E.....Shakopee
 Rieschl, Elizabeth K.....Jordan
 Rynda, Edwin R.....New Prague
 Sawaryniuk, Iwan.....Waconia
 Schimpelpfenig, George T.....Chaska

Simmonds, Harry N.....Prior Lake
 § Simons, Bernard H.....Chaska
 † Stahler, Paul A.....Jordan
 † § Westerman, Alvin.....Montgomery
 § Westerman, Fred C.....Montgomery

SOUTHWESTERN MINNESOTA MEDICAL SOCIETY

Cottonwood, Jackson, Murray, Nobles, Pipestone, and Rock Counties

Regular Meetings on call. Annual Meeting, November.

Number of Members—64

President
 DOMAN, VICTOR W.....Lakefield
Secretary
 HEIBERG, OLAF M.....Worthington
 Arnold, Elmer W.....Adrian
 Bader, J. L.....Slayton
 Basinger, Harold P.....Windom
 Basinger, Harvey R.....Mountain Lake
 Basinger, Homer P.....Windom
 Beckering, Gerrit.....Edgerton
 Benjamin, Walter G.....Pipestone
 Bofenkamp, F. William.....Luverne
 Boone, Ervin S.....Luverne
 † Brown, Alexander H.....Pipestone
 Buresh, Kenneth L.....Unknown
 Carlson, John V.....Westbrook
 Christiansen, Harold A.....Worthington
 Dawson, Lorin D.....Worthington
 Dokken, James H.....Windom
 Doman, Victor W.....Lakefield
 Downing, Fenworth M.....Worthington
 Hallin, Roger P.....Worthington

Halloran, Walter H.....Jackson
 Halpern, David J.....Brewster
 Harada, Thomas T.....Lake Wilson
 Harrison, Percy W.....Worthington
 Heiberg, Olaf M.....Worthington
 Hoyer, Ludolf J.....Windom
 Karleen, Bernard N.....Jackson
 Keyes, Robert W.....Pipestone
 Kilbride, Edwin A.....Worthington
 Koenecke, F. H.....Lakefield
 Kotval, Russell J.....Pipestone
 Laikola, Leslie A.....Adrian
 Lohmann, John G.....Pipestone
 Maitland, Edwin T.....Jackson
 Manson, Frank M.....Worthington
 Martin, Albert C.....Luverne
 Minge, Raymond K.....Worthington
 Nealy, Donald E.....Adrian
 Nicholson, Richard W.....Heron Lake
 Nywall, Dean D.....Slayton
 Odland, Donald M.....Luverne
 † § Pankratz, Peter J.....Taiwan (Formosa)
 § Patterson, Hugh D.....Slayton

§ Pierson, Roy F.....Slayton
 † § Piper, William A.....Mountain Lake
 Plott, Carol L.....Heron Lake
 § Plucker, Milton W.....Worthington
 Ritzinger, Frederick R.....Gowrie, Iowa
 Robinett, Robert W.....Worthington
 Rohrer, Christian A.....Worthington
 Rose, John T.....Lakefield
 Ryding, Vincent.....Mountain Lake
 Sawtell, Robert R.....Worthington
 § Schade, Frederick L.....Worthington
 § Schutz, Elmer S.....Mountain Lake
 Sherman, Charles L.....Luverne
 Slater, Sidney A.....Worthington
 † § Sogge, Ludwig L.....Windom
 Stam, John.....Worthington
 Stevenson, Basil M.....Fulda
 § Stratte, Harold C.....Windom
 § Vix, Vernon A.....Worthington
 Wells, Walter B.....Jackson
 § Williams, Charles A.....Pipestone
 † Williams, Leon A.....Minneapolis
 † § Zeller, Nichols H.....New York, N. Y.

STEARNS-BENTON COUNTY MEDICAL SOCIETY

Stearns and Benton Counties

Regular Meetings, third Thursday of month. Annual Meeting, December.

Number of Members—73

President
 BRIGHAM, CHARLES F., JR.....St. Cloud
Secretary
 PETERSEN, ROBERT T.....St. Cloud
 Alden, W. Charles.....Kimball
 Anderson, Edward M.....St. Cloud
 Autrey, William A.....St. Cloud
 Baumgartner, Florian H.....Albany
 Beuning, John B.....St. Cloud
 Brennan, Joseph G.....St. Cloud
 Brigham, Charles F., Jr.....St. Cloud
 Broker, Henry M.....St. Cloud
 Buscher, Julius C.....St. Cloud
 Cesnik, Robert J.....Sauk Rapids
 Clark, Harry B.....St. Cloud
 Cleaves, William D.....Sauk Centre
 Donaldson, Charles S.....St. Cloud
 Dredge, Thomas E.....St. Cloud
 DuBois, Julian F.....Sauk Centre
 DuBois, Julian F., Jr.....Sauk Centre
 Evans, Leslie M.....Sauk Rapids
 Fidelman, Norman E.....Foley
 § Fleming, Thomas N.....St. Cloud
 Gaida, Joseph B.....St. Cloud
 Goehrs, Gilman H.....St. Cloud

† Goehrs, Henry W.....St. Cloud
 Grant, John C.....Sauk Centre
 † Haberman, Emil.....Osakis
 Halenbeck, Philip L.....St. Cloud
 Halvarson, Kermit.....Aitkin
 Handler, Seymour.....St. Cloud
 Henry, Clarence J.....Milaca
 Henry, Joseph E.....Milaca
 † § Jones, Richard N.....St. Cloud
 Keith, Paul J.....Milaca
 § Kelly, John F.....Cold Spring
 Kim, Mark B.....St. Cloud
 Koening, Robert P.....Unknown
 † Kohler, Delphin W.....Tacoma, Wash.
 § Koop, Herman E.....Cold Spring
 Kuhlmann, Lawrence B.....Melrose
 LaFond, Edward M.....St. Cloud
 * Lewis, Claude B.....St. Cloud
 Lindeman, Raymond J.....Paynesville
 Loes, Louis A.....St. Cloud
 Luckemeyer, Carl J.....St. Cloud
 † § McDowell, John P.....St. Cloud
 Meyer, Anthony A.....Melrose
 § Milhaupt, Emmett N.....St. Cloud
 § Mueller, Rudolph B.....Richmond
 § Musachio, Nicholas F.....Foley

Myre, Clifford R.....Paynesville
 § Neils, Vernon E.....Sauk Rapids
 § Nesa, Curtis B.....St. Cloud
 Nietfeld, Aloys.....Sauk Centre
 § O'Keefe, James P.....St. Cloud
 Olinger, John N.....St. Cloud
 § Petersen, Robert T.....St. Cloud
 Phares, Otto C.....St. Cloud
 § Raetz, Sylvester J.....Maple Lake
 Raif, Henry J.....St. Cloud
 § Richards, William B.....St. Cloud
 Salk, Richard J.....Albany
 † § Sandven, Nels O.....Paynesville
 † Schatz, Francis J.....St. Cloud
 † Schmitz, Everett J.....Waukegan, Ill.
 † Sherwood, George E.....Kimball
 § Sisk, Harvey E.....St. Cloud
 † § Stangl, Philip E.....St. Cloud
 § Thuringer, Carl B.....St. Cloud
 Valenti, Dan A.....St. Cloud
 Vanderpool, Thomas E.....Paynesville
 Veranth, Leonard A.....St. Cloud
 § Walfred, Karl A.....St. Cloud
 § Wenner, Waldemar T.....St. Cloud
 § Wittrock, Louis H.....Watkins
 Zachman, Albert H.....Melrose

STEELE COUNTY MEDICAL SOCIETY

Steele County

Regular Meetings, second Tuesday of every other month. Annual Meeting, November.

Number of Members—24

President
 STRANSKY, THEODORE W.....Owatonna
Secretary
 FLOERSCH, ADRIAN J.....Owatonna
 Anderson, Franklin C.....Owatonna
 Arnesen, John F.....Owatonna
 Dewey, Donald H.....Owatonna
 Ertel, Edward Q.....Ellendale
 Fischer, John R.....Blooming Prairie

Floersch, Adrian J.....Owatonna
 § Halvorsen, Daniel K.....Owatonna
 Hartung, Elmer H.....Claremont
 Henry, Kenneth G.....Owatonna
 Honath, Donald H.....Owatonna
 Huff, J. S.....Owatonna
 Kulstad, Oscar S.....Dodge Center
 Kurtin, Joseph J.....New York, N. Y.
 § Lundquist, Curt W.....Owatonna
 § McEnaney, Clifford T.....Owatonna

§ McIntyre, John A.....Owatonna
 † § Melby, Benedik.....Blooming Prairie
 † § Morehead, Dewey E.....Owatonna
 § Olson, Albert J.....Owatonna
 § Roberts, Oliver W.....Owatonna
 § Schaefer, Joseph F.....Owatonna
 † Senn, Edward W.....Owatonna
 § Stransky, Theodore W.....Owatonna
 † § Wilkowske, Rudolph J.....Owatonna

COUNTY SOCIETY ROSTER

UPPER MISSISSIPPI MEDICAL SOCIETY

Aitkin, Beltrami, Cass, Clearwater, Crow Wing, Hubbard, Koochiching, Lake of the Woods,
Morrison, Tood and Wadena Counties
Annual Meeting, January
Number of Members—99

President
PARKER, WARREN E.....Sebeka
Secretary
BADEAUX, GEORGE I.....Brainerd

Adkins, James J.....Bertha
Anderson, Arden O.....Brainerd
Anderson, Werner W.....Brainerd
Badeaux, George I.....Brainerd
Bender, James H.....Brainerd
Benson, Alfred H.....Little Falls
Bissinger, Lester L.....Brainerd
Bolstad, Owen C.....Little Falls
Borgerson, Arthur H.....Long Prairie
Byrne, William J.....St. Paul
Cadle, George E.....Brainerd
Closuit, Frederick C.....Aitkin
Cook, Jay M.....Staples
Coombs, Carl H.....Cass Lake
Craig, Clair C.....International Falls
Cushing, Robert L.....Brainerd
Davis, Lloyd T.....Wadena
Davis, Luther F.....Wadena
Deweese, Wilford J.....Bemidji
Eiler, John.....Park Rapids
Erickson, Alvin O.....Long Prairie
Fitzsimons, William E., Jr.....Brainerd
Fortier, George M. A.....Little Falls
Franklin, Gordon W.....Northome
* Garlock, Arthur V.....Bemidji
† Garlock, DeWitt W.....Highlands, Calif.
† Ghostley, Mary C.....Bemidji
* † Gilmore, Rowland.....Crookston
Griffin, John W., Jr.....Bemidji
Grimes, Paul T.....Park Rapids

Groschupf, Richard P.....Bemidji
§ Groschupf, Theodore P.....Bemidji
§ Grose, Frederick N.....Clarissa
Halme, William B.....Wadena
§ Hanover, Ralph D.....International Falls
Hansen, Milo L.....Little Falls
Hartjen, Jason K.....Bemidji
Hendricks, Esten J.....Verndale
Hildebrand, John E.....Bemidji
Hoganson, Donald E.....Bemidji
* House, Zachariah E.....Burbank, Calif.
† Houston, Donald M.....Park Rapids
§ Hughes, Bernard J.....Brainerd
Johnson, Douglas L.....St. Paul
† Johnson, Einar W.....Bemidji
Kanne, Earl R.....Brainerd
Kelley, Roger E.....Crosby
Kinports, Edward B.....International Falls
* † Knight, Edwin G.....Svanville
Knoll, W. V.....Crosby
Larson, LeRoy J.....Bagley
Lee, Hubert W.....Brainerd
Leinonen, Wendla E.....Wadena
§ Lenarz, Albert J.....Browerville
Lofstrom, Dennis E.....Pine River
Longfellow, Helen W.....Brainerd
Lund, Werner J.....Staples
Lundsten, Leslie C.....Bemidji
§ MacDonald, Roger A.....Littlefork
Macheledd, Neil L.....Wadena
§ McLane, William O.....Brainerd
§ Marshall, Clark M.....Crosby
§ Meller, Maurice.....Brainerd
§ Mortenson, Howard O.....Menahga
§ Mosby, Maurice E.....Long Prairie

§ Mulligan, Arthur M.....Brainerd
Murtaugh, Robert J.....Wadena
† Nelson, Nesmith P.....Minneapolis
Nixon, James B.....Crosby
§ O'Leary, John B.....Brainerd
Olson, Lillian A.....Ah-gwah-ching
Palmer, Harry A.....Blackduck
Parker, Charles W.....Wadena
§ Parker, Warren E.....Sebeka
§ Pedersen, Robert L.....Brainerd
Petraborg, Harvey T.....Aitken
Pierce, Charles H.....Wadena
§ Quanstrom, Virgil E.....Brainerd
Reichelderfer, Charles F.....Staples
§ Ringle, Otto F.....Walker
§ Sanderson, Anton G.....Ashby
† Schmitz, Glen P.....Little Falls
Schwyzer, Arnold G.....St. Paul
Simons, Edwin J.....Edina
§ Skaife, William F.....Little Falls
§ Spieler, Forest B.....Pequot Lakes
Stein, Raymond J.....Pierz
§ Stoy, Robert A.....Little Falls
Vandersluis, Charles W.....Bemidji
Watson, Alexander M.....Royalton
† Watson, Percy T.....Miami, Fla.
§ Watson, Sidney W.....Royalton
Whitemore, Dexter D.....Bemidji
§ Will, Charles B.....International Falls
Will, W. W.....Bertha
Williams, Mervyn M.....Ah-gwah-ching
† Wilson, Robert E.....Minneapolis
Wingquist, Carl G.....Crosby
Witter, Robert L.....Wadena

WABASHA COUNTY MEDICAL SOCIETY

Wabasha County
Annual Meeting, first Thursday after first Monday in October.
Number of Members—14

President
MAHLE, DONALD G.....Plainview
Secretary
FLESCHÉ, BERNARD A.....Lake City
§ Bayley, E. Covell.....Lake City

§ Bouquet, Bertram J.....Wabasha
Bowers, Robert N.....Lake City
† Collins, Joseph S.....Wabasha
Ekstrand, LeRoy M.....Wabasha
Ellis, Earl Wm.....Elgin
§ Flatt, John R.....Wabasha
§ Flesche, Bernard A.....Lake City

§ Gjerde, William P.....Lake City
Globe, Robert A.....Plainview
§ Mahle, Donald G.....Plainview
Ochsner, Clarence G.....Wabasha
Replogle, William H.....Los Angeles, Calif.
§ Sontag, David W.....Lake City

WASECA COUNTY MEDICAL SOCIETY

Waseca County
Regular Meeting, January. Annual Meeting, January.
Number of Members—9

President
DAVIS, RAYMOND D.....Waseca
Secretary
FLORINE, MARTIN C.....Janesville

§ Davis, Raymond D.....Waseca
§ Florine, Martin C.....Janesville
† § Gallagher, Bernard J.....Waseca
§ Hottinger, Raymond C.....Janesville
* † § McIntire, Homer M.....Waseca

§ Normann, Stephen T., Jr.....Waseca
Oeljen, Siegfried C. G.....Waseca
§ Olds, George H.....New Richland
Swenson, Orvie J.....Waseca

WASHINGTON COUNTY MEDICAL SOCIETY

Washington and Dakota Counties
Regular Meetings, second Tuesday in each month. Annual Meeting, December.
Number of Members—22

President
STUHR, JOHN W.....Stillwater
Secretary
KIOLBASA, EDWARD B.....Stillwater

Brabec, Paul F.....Hastings
§ Carlson, Russel E.....Stillwater
Fasbender, Herman T.....Hastings
† § Holcomb, Joel T.....Marine-on-St. Croix

† Hooper, Worth A.....Long Beach, Calif.
† Humphrey, Wade R.....Stillwater
§ Jenson, James E.....Stillwater
Jewewski, Raymond J.....Stillwater
§ Jurgens, Manley F.....Stillwater
Just, Herman J.....Hastings
§ Kiolbasa, Edward B.....Stillwater
Kulzer, Norbert J.....Hastings
§ McCarten, Francis M.....Stillwater

Mensheha, Nicholas.....Forest Lake
† Poirier, Joseph A.....Forest Lake
Ruggles, George M.....Forest Lake
§ Sherman, Carnot H.....Bayport
§ Stuhr, John W.....Stillwater
Torghele, John R.....Hastings
Van Meier, Henry.....Stillwater
Weiss, Carl A.....Hastings
Wood, Lloyd T.....Forest Lake

COUNTY SOCIETY ROSTER

WEST CENTRAL MINNESOTA MEDICAL SOCIETY

Big Stone, Pope, Stevens, and Traverse Counties

Regular Meetings, one Tuesday in March, May, September and November.

Annual Meeting, November.

Number of Members—28

<i>President</i>	
LEE, GORDON E.....	Glenwood
<i>Secretary</i>	
GOOD, ROY H.....	Glenwood
Arneson, Arthur I.....	Morris
Behmler, Frederick Wm.....	Morris
†Bergan, Otto.....	Clinton
†Bolsta, Charles.....	Ortonville
†Bucher, Foster D.....	Starbuck
†Eberlin, Edward A.....	Glenwood

§ Eide, O. A.....	Hancock
† Elsey, James R.....	Glenwood
Good, Roy H.....	Glenwood
Hedemark, Homer H.....	Ortonville
Hedemark, Truman A.....	Ortonville
Karn, Jacob F.....	Ortonville
§ Kooda, Jennings C.....	Morris
Lee, Gordon E.....	Glenwood
† Letson, Robert D.....	Glenwood
† Lindberg, Alfred L.....	Wheaton
† § Linde, Herman.....	Cyrus

§ Magnuson, Allen E.....	Wheaton
§ Merrill, Robert W.....	Morris
§ Muir, Walter E.....	Browns Valley
§ Oliver, Irwin L.....	Graceville
† Ranson, Matthias L.....	Hancock
§ Rossberg, Raymond A.....	Morris
§ Swedenburg, Paul A.....	Glenwood
§ Swendseen, Carl J.....	Graceville
§ Watson, Robert M.....	Morris
§ Winge, H. C.....	Wheaton
§ Zemple, Allen R.....	Starbuck

WINONA COUNTY MEDICAL SOCIETY

Winona County

Regular meetings, first Monday in January, April, July and October.

Annual Meeting, first Monday in January.

Number of Members—26

<i>President</i>	
FINKELNBURG, WILLIAM O.....	Winona
<i>Secretary</i>	
WILSON, LOUIS J.....	Winona
Boardman, Dalmon V.....	Winona
Christensen, Eli E.....	Winona
Degallier, Daniel.....	Winona
Finkelnburg, William O.....	Winona
Haesly, Warren W.....	Winona
Hartwich, Roger F.....	Winona
Heise, Carl vR.....	Winona

§ Heise, Herbert vR.....	Winona
§ Heise, Paul vR.....	Winona
§ Heise, Philip vR.....	Winona
§ Heise, William vR.....	Winona
§ Hughes, Sidney O.....	Winona
§ Johnston, Leonard F.....	Winona
§ Keyes, John D.....	Winona
§ Loomis, George L.....	Winona
† § McLaughlin, Edmund M.....	Winona
§ Mattison, Percy A.....	Winona
§ Meinert, Albert E.....	Winona
§ Neumann, Conrad A.....	Lewiston

§ Page, Raymond L.....	St. Charles
† § Robbins, Charles P.....	Winona
§ Roemer, Henry J.....	Winona
§ Rogers, Charles W.....	Winona
§ Satterlee, Howard W.....	Lewiston
§ Schmidt, Hilmar R.....	Rushford
§ Tweedy, John A.....	Winona
§ Tweedy, Robert B.....	Winona
§ Vollmer, Frederick J.....	Winona
§ Wilson, Louis J.....	Winona
§ Wilson, Rolland H.....	Winona
§ Younger, Lewis I.....	Winona

WRIGHT COUNTY MEDICAL SOCIETY

Wright County

Regular Meetings, first Tuesday of every second month. Annual Meeting first Tuesday in November.

Number of Members—17

<i>President</i>	
GUILFOILE, PIERRE J.....	Delano
<i>Secretary</i>	
CATLIN, THEODORE J.....	Buffalo
† Abullarade, Jose A.....	Unknown
§ Anderson, Waldo P.....	Buffalo

§ Bendix, Lester H.....	Annandale
† § Catlin, John J.....	Buffalo
§ Catlin, Theodore J.....	Buffalo
§ Ellison, Frank E.....	Monticello
§ Greenfield, William T.....	Cokato
§ Grundset, Ole J.....	Montrose
§ Guilfoile, Pierre J.....	Delano
§ Hall, William E.....	Maple Lake

§ Hart, William E.....	Monticello
§ Purves, G. Harland.....	Buffalo
§ Sandeen, Robert M.....	Buffalo
§ Smorstok, Matthew B.....	Monticello
§ Thielen, Robert D.....	Saint Michael
§ Thomas, William H.....	Howard Lake
§ Vaaler, Robert.....	Cokato

ZUMBRO VALLEY MEDICAL SOCIETY

Olmstead, Houston, Fillmore and Dodge Counties

Regular Meetings, first Wednesday of odd numbered months. Annual Meeting first

Wednesday in November.

Number of Members—532

<i>President</i>	
WEIR, JAMES F.....	Rochester
<i>Secretary</i>	
WELLMAN, WILLIAM E.....	Rochester
Aaro, Leonard A.....	Rochester
Achor, Richard W. P.....	Rochester
Adson, Martin A.....	Rochester
Affeldt, Daniel E.....	Kasson
Ahlfs, Jacob J.....	Brainerd
Allen, Edgar V. N.....	Rochester
Amberg, Samuel.....	Rochester
Amick, Lawrence D.....	Rochester
Andersen, Howard A.....	Rochester
Anderson, Mark J.....	Rochester
Anderson, Markham J., Jr.....	Rochester
Anderson, Milton W.....	Rochester
Arnold, John W.....	Rochester
Anzel, Sanford H.....	Rochester
Baggenstoss, Archie H.....	Rochester
Bair, Hugo L.....	Rochester
Baker, George S.....	Rochester
Baker, Harry R.....	Hayfield
Baker, Hillier L., Jr.....	Rochester
† Balfour, Donald C.....	Rochester
† Banner, Edward A.....	Rochester
† Bargaen, J. Arnold.....	Rochester
† Barker, Nelson W.....	Rochester

§ Barnes, Arlie R.....	Rochester
§ Barry, Maurice J., Jr.....	Rochester
§ Bartholomew, Lee E.....	Rochester
§ Bartholomew, Lloyd G.....	Rochester
§ Bastron, James A.....	Rochester
§ Bayard, Edwin D.....	Rochester
§ Beahrs, Oliver H.....	Rochester
† § Benedict, William L.....	Rochester
§ Berge, Kenneth G.....	Rochester
† § Berkman, David M.....	Oronoco
§ Berkman, John M.....	Rochester
§ Berman, Irwin B.....	Rochester
§ Berman, Stanley.....	Rochester
§ Bernatz, Philip E.....	Rochester
§ Bickel, William H.....	Rochester
† Bigelow, Charles E.....	Dodge Center
† Bigg, Richard L.....	Rochester
§ Birkhead, Newton C.....	Rochester
§ Black, B. Marden.....	Rochester
§ Blackburn, Charles M.....	Rochester
† Bonnet, John D.....	Rochester
§ Botham, Richard J.....	Rochester
§ Botti, John D.....	Rochester
§ Boyd, David A., Jr.....	Rochester
† Boyd, George K.....	New York, N. Y.
† Bozanich, Milosh S.....	Unknown
† § Braasch, William F.....	Rochester
§ Brandenburg, Robert O.....	Rochester
§ Broadbent, James C.....	Rochester

† Brow, Raymond E.....	Rochester
§ Brown, Alex B.....	Rochester
§ Brown, Henry A.....	Rochester
§ Brown, Joe R.....	Rochester
§ Brown, Philip W.....	Rochester
§ Brunsting, Louis A.....	Rochester
† Bruwer, Andre J.....	Rochester
† Buie, Louis A.....	Rochester
§ Bull, Frances E.....	Rochester
§ Burchell, Howard B.....	Rochester
§ Burger, Thomas C.....	Rochester
§ Burich, Harry F.....	Rochester
§ Burke, Edmund C.....	Rochester
§ Burton, Truman Y.....	Rochester
§ Butt, Hugh R.....	Rochester
§ Cain, James C.....	Rochester
§ Callahan, John A.....	Rochester
§ Campagna, Mario J.....	Rochester
§ Campbell, Donald C.....	Rochester
§ Campbell, Malcolm K.....	Rochester
§ Carr, David T.....	Rochester
§ Carryer, Haddon McC.....	Rochester
§ Childs, Donald S., Jr.....	Rochester
§ Christensen, Norman A.....	Rochester
§ Clagett, O. Theron.....	Rochester
§ Clark, Edward C.....	Rochester
§ Clark, Leslie W.....	Spring Valley
§ Clements, Betty G. E.....	Rochester
† Clifton, Theodore A.....	Hollywood, Fla.

COUNTY SOCIETY ROSTER

Colby, Malcolm Y., Jr. Rochester
Comfort, Mandred W. Rochester
Connolly, Daniel C. Rochester
Cook, Edward N. Rochester
Cooley, Jack C. Rochester
Cooper, Talbert Rochester
Corbin, Kendall B. Rochester
Cottone, Francis J. Rochester
Coventry, Markham B. Rochester
Covey, Kenneth W. Rochester
Craig, Winchell McK. Rochester
Culp, Ormond S. Rochester
Dahlin, David C. Rochester
Daly, David. Rochester
Danford, Harold G. Rochester
Daugherty, Guy W. Rochester
Davis, George D. Rochester
Dearing, William H. Rochester
Decker, Barry. Rochester
Decker, David G. Rochester
Devine, Kenneth D. Rochester
DeWeerd, James H. Rochester
Diessner, Grant R. Rochester
Dines, David E. Rochester
Dixon, Claude F. Rochester
Dockerty, Malcolm B. Rochester
Dodge, Henry W., Jr. Rochester
Donin, Jerry F. Portsmouth, Va.
Donoghue, Francis E. Rochester
Douglass, Bruce E. Rochester
Doyle, James R. Rochester
Drips, Della G. Oronoco
DuShane, James W. Rochester
Dyer, John Allen. Rochester
Eaton, Lealdes M. Rochester
Edelmann, Robert B. Rochester
Edwards, Jesse E. Rochester
Edwin, Russell L. Rochester
Elkins, Earl C. Rochester
Ellis, F. Henry. Rochester
Emmett, John L. Rochester
Englund, Garth W. Mabel
Erich, John B. Rochester
Erickson, Donald J. Rochester
Esser, Robert A. Paris, France
Estes, J. Earle. Rochester
Eusterman, George B. Rochester
Evans, Harold W. Rochester
Everts, Arrah B. Rochester
Fabar, John E. Rochester
Failor, Harlan J. Rochester
Faucett, Robert L. Rochester
Faulconer, Albert Jr. Rochester
Feinberg, Walter D. Rochester
Feldmann, Floyd M. New York, N. Y.
Ferris, DeWard O. Rochester
Figi, Frederick A. Rochester
Flor, Frank S. Rochester
Foss, Edward L. Rochester
Foulk, William T., Jr. Rochester
Frazier, Shervert H., Jr. Rochester
Frethem, Allen A. Rochester
Fricke, Robert E. Rochester
Gambill, Carl M. Rochester
Gambill, Earl E. Rochester
Gardner, Gawinn B. Rochester
Gardner, John U. Rochester
Gardner, Victor H., Jr. Rochester
Garono, Barbara J. Rochester
Gastineau, Clifford F. Rochester
Gatchell, Frank G. Rochester
Gaunt, William D. Rochester
Geraci, Joseph E. Rochester
Ghormley, Ralph K. Rochester
Giffin, Herbert Z. Rochester
Giffin, Mary E. Rochester
Gifford, R. W., Jr. Rochester
Gill, Charles Richard. Rochester
Gilpin, Charles A., Jr. Rochester
Ginsberg, Robert L. San Antonio, Tex.
Glathe, John P. Rochester
Glick, Dallas D. San Francisco, Calif.
Goehrs, Homer R. Rochester
Goldstein, Norman P. Rochester
Good, C. Allen, Jr. Rochester
Gottlieb, Cornelius M. Tacoma, Wash.
Graf, George P. Rochester
Green, Paul A. Rochester
Greene, Laurence F. Rochester
Griffiths, Edward K. Rochester
Grindlay, John H. Rochester
Gross, John B. Rochester
Habein, Harold C. Rochester
Habein, Harold C., Jr. Rochester
Hagedorn, Albert B. Rochester
Haines, Samuel F. Rochester
Haliburton, Robert A. Rochester
Hallberg, Olav Erik. Rochester
Hallenbeck, Dorr F. La Jolla, Calif.
Hallenbeck, George A. Rochester
Hanlon, David G. Rochester
Hanson, Norbert Orrin. Rochester
Hardy, William M. Rochester
Hargraves, Malcolm M. Rochester

Harlan, William L. Rochester
Harrington, Stuart W. Rochester
Harris, Lloyd E. Rochester
Harshbarger, Harry G. Rochester
Hartman, Howard R. Rochester
Hartridge, Virginia B. Rochester
Hartwig, John A. Rochester
Hassel, Carl W., Jr. Rochester
Havens, Fred Z. Riverside, Calif.
Hayles, Alvin B. Rochester
Heck, Frank J. Rochester
Hedrick, William L. Rochester
Heilman, Dorothy M. H. San Diego, Calif.
Heilman, Fordyce R. Rochester
Helland, John W. Spring Grove
Helmholz, Henry F. Rochester
Hempstead, Bert E. Rochester
Hench, Philip S. Rochester
Henderson, Edward D. Rochester
Henderson, John W. Rochester
Henderson, Lowell L. Rochester
Hepper, Norman G. Rochester
Herbert, Edna E. Rochester
Hewitt, Edith S. Rochester
Hewitt, Richard M. Rochester
Heyerdale, Oscar C. Rochester
Higgins, John A. Rochester
Hill, John Roger. Rochester
Hill, Richard Woolsey. Rochester
Hines, Edgar A., Jr. Rochester
Hodgson, Corrin H. Rochester
Hodgson, John R. Rochester
Holland, C. R. Rochester
Hollenhorst, Robert W. Rochester
Holman, Colin B. Rochester
Hooker, John P. Rochester
Horton, Bayard T. Rochester
Howard, Frank M., Jr. Rochester
Howell, Llewelyn P. Rochester
Howland, Willard J. Rochester
Huizenga, Kenneth A. Rochester
Hunt, Arthur B. Rochester
Hunter, James S., Jr. Rochester
Ivins, John C. Rochester
Ivy, Horace K. Rochester
Jackman, Raymond J. Rochester
James, Joseph M. Rochester
Jarvis, Walter H., Jr. Rochester
Johnson, Carl E. Rochester
Johnson, Einer W., Jr. Rochester
Johnson, Ralph B. Lanesboro
Johnson, Ray A. New York, N. Y.
Johnson, William J. Rochester
Joyce, George L. Rochester
Judd, Edward S., Jr. Rochester
Jurgens, John L. Rochester
Karansky, Stanley. Rochester
Kazdan, Martin S. Rochester
Kearns, Thomas P. Rochester
Keating, Francis R., Jr. Rochester
Keith, Haddow M. Rochester
Keith, Norman M. Rochester
Kelly, Patrick J. Rochester
Kemper, James W. Rochester
Kennedy, Roger L. J. Rochester
Kernohan, James W. Rochester
Kibler, Charles E. Rochester
Kiely, Joseph M. Rochester
Kierland, Robert R. Rochester
Kincaid, Owings W. Rochester
Kirby, Thomas J., Jr. Rochester
Kirklin, Byril R. Rochester
Kirklin, John W. Rochester
Klass, Donald W. San Antonio, Tex.
Knutson, Lewis A. Spring Grove
Koelsche, Giles A. Rochester
Kragh, Lyle V. Rochester
Kroll, Harry G. Unknown
Krusen, Frank H. Rochester
Kuykendall, Sam J. Rochester
Kvale, Walter F. Rochester
Lake, Clifford F. Rochester
Langrall, Harrison, M. Rochester
Lazarte, Jorge A. Rochester
LeClair, J. Maurice. Rochester
Leigh, John E. Rochester
Lillie, Harold I. Rochester
Lillie, John C. Rochester
Lipscomb, Paul R. Rochester
Litin, Edward M. Rochester
Litzow, Thaddeus J. Rochester
Lofgren, Karl A. Rochester
Logan, Archibald H. Rochester
Logan, George B. Rochester
Long, Fred M. Rochester
Love, J. Grafton. Rochester
Lundy, John S. Rochester
Lyons, William S. Douglas
MacCarty, Collin S. Rochester
MacCarty, William C. Rochester
MacLean, Alexander R. Rochester
Madalin, Herbert E. Rochester
Magath, Thomas B. Rochester

Mahe, Frank T. Rochester
Maks, Stephen W. Rochester
Manger, William M. Rochester
Mankin, Harold T. Rochester
Martens, Theodore G. Rochester
Martin, Gordon M. Rochester
Martin, Maurice J. Rochester
Martin, William J. Rochester
Massarelli, John J., Jr. Rochester
Masson, Duncan M. Rochester
Masson, James C. Rochester
Masson, James K. Rochester
Mathieson, Don R. Rochester
Mayberry, William E. Rochester
Mayne, John G. Rochester
Mayo, Charles W. Rochester
McBean, James B. Rochester
McCleary, Jack E. Rochester
McClure, Rensselaer W., Jr. Rochester
McConahey, William M., Jr. Rochester
McCown, Louis K. Rochester
McDonald, John R. Rochester
McIlhany, Mary Lou. Wheeler, Texas
McKaig, Carl B. Pine Island
McKay, John W. Rochester
Menguy, Rene B. Rochester
Merritt, Wallace A. Rochester
Messer, James W. Rochester
Messick, Richard T. Rochester
Metzerott, Kirk O. Rochester
Meyerding, Henry W. Rochester
Miller, Roland D. Rochester
Miller, Ross H. Rochester
Millikan, Clark H. Rochester
Mills, Stephen D. Rochester
Moersch, Frederick P. Rochester
Moersch, Herman J. Rochester
Moertel, Charles G. Rochester
Molnar, George D. Rochester
Montgomery, Hamilton. Rochester
Morisaki, Michael M. Rochester
Morlock, Carl G. Rochester
Morrow, George W., Jr. Rochester
Mulder, Donald W. Rochester
Mussey, Mary E. Rochester
Mussey, Robert D. Rochester
Myers, Richard L. Rochester
Myers, Thomas T. Rochester
Myre, Theodore T. Rochester
Nehring, Jesse P. Preston
Neilson, William G. Unknown
Newnum, Raymond L. Rochester
Nichols, Donald R. Rochester
Norris, Neil T. Caledonia
Odel, Howard M. Rochester
Olsen, Arthur M. Rochester
Olson, Ernest A. Pine Island
Olson, Grant E. West Concord
Onifer, Theodore M. Rochester
Ongard, L. Kenneth. Houston
Osborn, John E. Rochester
Osmundson, Philip J. Rochester
Owen, Charles A., Jr. Rochester
Paris, Jaime. Germany
Parker, Harry L. Rochester
Parker, Robert L. Rochester
Parkhill, Edith M. Rochester
Parkin, Thomas W. Rochester
Parr, Eugene Q. Rochester
Patrick, Robert T. Rochester
Paulson, John A. Rochester
Pawlias, Kenneth T. Rochester
Payne, William S. Rochester
Pearce, Francis M., Jr. Rochester
Pease, Gertrude L. Rochester
Peck, Owen C. Rochester
Pemberton, John D. Rochester
Perry, Harold. Rochester
Peterman, Albert F. Rochester
Peters, Gustavus A. Rochester
Petersen, Magnus C. Rochester
Petersen, Robert W. Rochester
Peterson, Lowell F. A. Rochester
Pettersen, George R. St. Paul
Pettet, John R. Unknown
Phalen, Patrick T. Rochester
Phelan, John T. Rochester
Phifer, Robert L. Rochester
Piper, Monte C. Lacanada, Calif.
Plum, George E. Rochester
Pollard, William S. Rochester
Pooley, Howard F. Rochester
Pool, Thomas L. Rochester
Pratt, George F. Rhinelander, Wis.
Pratt, Joseph Hyde, Jr. Rochester
Prickman, Louis E. Rochester
Priestley, James T. Rochester
Pruitt, Raymond D. Rochester
Pugh, David G. Rochester
Purnell, Don C. Rochester
Ragen, Patrick A. Rochester
Ralston, Donald E. Rochester
Randall, Lawrence M. Rochester
Randall, Raymond V. Rochester

COUNTY SOCIETY ROSTER

† Reifsnnyder, William Henry, III.....	Rochester	Silver, Arthur W.....	Rochester	Virnig, Hildegard, J.....	Caledonia
Reitemeier, Richard J.....	Rochester	† Simmons, William H.....	Lexington, Ky.	† Wagner, Henry P.....	Rochester
ReMine, William H., Jr.....	Rochester	§ Simonton, Kinsey M.....	Rochester	Wagoner, James M.....	Harmony
Restall, Charles J.....	Rochester	Skaug, Harold M.....	Chatfield	Wakai, Coolidge S.....	Rochester
Rhodes, Donald V.....	Rochester	§ Slocumb, Charles H.....	Rochester	Wakefield, Elmer G.....	Rochester
Riser, Alden F.....	Stewartville	† § Smith, Frederick L.....	Rochester	† § Wakim, Khalil G.....	Rochester
Roberts, Frank E.....	Unknown	§ Smith, Harry L.....	Rochester	Waldmann, Edward B.....	Rochester
Robinson, David B.....	Rochester	§ Smith, Lucian A.....	Rochester	Walters, Waltman.....	Rochester
Robinson, Hugh P.....	Rochester	§ Smith, Meredith P.....	Rochester	Ward, Louis E.....	Rochester
Rodenbaugh, Fredrich H.....	Rochester	§ Smith, Reginald A.....	Rochester	Watkins, Charles H.....	Rochester
Rogne, William G.....	Spring Grove	§ Smith, William G.....	Rochester	Watson, Eleanor J.....	Unknown
Rome, Howard P.....	Rochester	§ Sommerville, Robert L.....	Rochester	Watson, John R.....	Rochester
Rooke, Edward D.....	Rochester	§ Soule, Edward H.....	Rochester	Waugh, John M.....	Rochester
Roth, Harry Leo.....	Oakland, Calif.	§ Spittel, John A., Jr.....	Rochester	Weber, Harry M.....	Rochester
Rottenberg, Everett N.....	Rochester	§ Sprague, Randall G.....	Rochester	Weed, Lyle A.....	Rochester
Rovelsad, Randolph A.....	Rochester	† Spudis, Edward V.....	Rochester	Weeks, Richard E.....	Rochester
Rucker, Charles W.....	Rochester	Stanley, Charles O.....	Rochester	† Weil, Max H.....	Rochester
Rushon, Joseph G.....	Rochester	Starr, Grier F.....	Rochester	§ Weir, James F.....	Rochester
Ryneearson, Edward H.....	Rochester	† Starr, Jason L.....	Rochester	§ Welch, John S.....	Rochester
Sabin, Frederick C.....	Rochester	§ Stauffer, Maurice H.....	Rochester	Wellman, William E.....	Rochester
Salassa, Robert M.....	Rochester	Stein, Harold A.....	Rochester	Wellner, Theodore O.....	Rochester
Sanchez, James J.....	Rochester	§ Steinhilber, Richard M.....	Rochester	Wente, Harold A.....	Rochester
Sanford, Arthur H.....	Rochester	Stevens, Robert G.....	Rochester	Westrup, John E.....	Lanesboro
Sauer, William G.....	Rochester	§ Stickney, J. Minott.....	Rochester	Weyhrauch, William R.....	Rochester
Sayre, George P.....	Rochester	§ Stillwell, George K.....	Rochester	Whisnant, Jack P.....	Rochester
Scanlon, Paul W.....	Rochester	§ Stülwell, George G.....	Rochester	† Whitcomb, Fred F., Jr.....	Rochester
Schaefer, Joseph C.....	Rochester	† Stoltze, Cynthia A.....	Rochester	Wilcox, Charles F., III.....	Rochester
Scheifley, Charles H.....	Rochester	† Stool, Newsom.....	Rochester	Wilder, Russell M.....	Rochester
Schirger, Alexander.....	Rochester	† Stormont, James R.....	Rochester	Williams, Henry L., Jr.....	Rochester
Schmidt, Herbert W.....	Rochester	† Stroebe, Charles F., Jr.....	Rochester	Wilson, Robert B.....	Rochester
Schneider, James A.....	Rochester	§ Sturtz, George S.....	Rochester	Winkel, Viktor O.....	Rochester
Scholz, Donald A.....	Rochester	§ Sullivan, Charles R.....	Rochester	Winkelmann, Richard K.....	Rochester
† Schumacher, Otto P.....	Rochester	§ Svien, Hendrik J.....	Rochester	Winn, William E., Jr.....	New Orleans, La.
† Schwartz, John T.....	Rochester	§ Symmonds, Richard E.....	Rochester	Winter, Malcolm D., Jr.....	Rochester
Sciarra, Paschal A.....	Rochester	Theye, Richard A.....	Rochester	Wittoesch, J. Hans.....	Rochester
Scott-Miller, James R.....	Rochester	Thompson, Gershom J.....	Rochester	§ Wollaeger, Eric E.....	Rochester
Scudamore, Harold H.....	Rochester	§ Tillisch, Jan H.....	Rochester	† § Woltman, Henry W.....	Rochester
Seay, James Elbert, III.....	Rochester	Turner, John C., Jr.....	Rochester	† Wood, Harry G.....	Rochester
† Sebrechts, Paul.....	Great Lakes, Ill.	§ Uihlein, Alfred.....	Rochester	† Woodington, George F.....	Rochester
§ Selby, John B.....	Rochester	§ Underdahl, Laurentious O.....	Rochester	† Woodward, Edward, Jr.....	Rochester
§ Seldon, Thomas H.....	Rochester	§ Updike, Edwin H., II.....	Unknown	§ Woolner, Lewis B.....	Rochester
Senders, Wilbur L.....	Rochester	Utz, David C.....	Rochester	Worrell, Janet.....	Rochester
Shea, Daniel W.....	Rochester	† Vance, John W.....	Rochester	Wright, J. Leo.....	Rochester
Shick, Richard M.....	Rochester	Van Herik, Martin.....	Rochester	Wuest, John H., Jr.....	Rochester
§ Siekert, Robert G.....	Rochester	§ Vaughn, Louis D.....	Rochester	Yarbro, Harold R.....	Rochester
		§ Verby, John E., Jr.....	Rochester	§ Young, Henry H.....	Rochester
		† Viren, Fred K.....	Rochester		

Alphabetic Roster

Key to Symbols:

*Deceased; †Associate, Junior Associate, Residency, Affiliate and Life Member; ‡In Service

Aanes, Almer M.	Red Wing	Arey, Stuart Lane.	Minneapolis	Bartness, John	Albert Lea
Aaro, Leonard A.	Rochester	Arhelger, Stuart	Minneapolis	Bartzen, Peter J.	Duluth
Abernathy, Robert S.	Minneapolis	Arlander, Clarence E.	Minneapolis	Basinger, Harold P.	Windom
Abraham, Arden L.	Duluth	Arling, Leonard S.	Minneapolis	Basinger, Harvey R.	Mountain Lake
Abrams, Alexander, Jr.	St. Paul	Arms, James J.	Minneapolis	Basinger, Homer P.	Windom
Abramson, Milton	Minneapolis	Armstrong, Byron H.	Hopkins	Bastron, James A.	Rochester
† Abullarade, Jose A.	Unknown	Armstrong, Ralph S.	Winnebago	Batdorf, B. Niles	Mankato
Achor, Richard W. P.	Rochester	Arndt, Harry W.	Detroit Lakes	Bauer, Eugene L.	St. Paul
† Adair, Albert F., Jr.	St. Paul	Arnesen, John F.	Owatonna	Bauer, Paul G.	Faribault
* Adams, Bertram S.	Hibbing	Arneson, Arthur I.	Morris	Baumgartner, Florian H.	Albany
† Adams, R. Charles	Rochester	Arnold, Ann W.	Minneapolis	Bayley, E. Covell	Lake City
Addy, Edward R.	Gilbert	Arnold, Elmer Wm	Adrian	Bayrd, Edwin D.	Rochester
Addins, Charles D.	Minneapolis	† Arnold, John W.	Rochester	Beach, Northrop	Minneapolis
Addins, Galen H.	Cambridge	Arnuquist, Andrew S.	St. Paul	Beahrs, Oliver H.	Rochester
Addins, James T.	Bertha	Arny, Frederick P.	St. Paul	† Beals, Hugh	LaJolla, Calif.
Adson, Martin A.	Rochester	Arvidson, Carl G.	Minneapolis	Bean, Charles N.	Waconia
Afeldt, Daniel E.	Kasson	Arzt, Philip K.	St. Paul	Beaton, J. Gordon	Northfield
† Aga, John H.	Brainerd	Asta, Joseph J.	Duluth	Beck, Charles J.	No. St. Paul
† Agustsson, Hreidar	Aberdeen, Maryland	Athens, Alvin G.	Duluth	† Becker, Arnetta M.	Lincoln, Neb.
Ahern, Eugene	Minneapolis	Atmore, William G.	Duluth	Becker, Frederick T.	Duluth
Ahlfs, Jacob J.	Caledonia	Aufderheide, Arthur C.	Duluth	Beckering, Gerrit	Edgerton
Ahlstrom, Robert C.	Braham	† Aune, Martin	Minneapolis	Bedford, Edgar Wm.	Minneapolis
Ahola, Kenneth E.	Hibbing	Aurelius, J. Richards	St. Paul	Beech, Raymond H.	St. Paul
† Ahrens, Albert E.	St. Paul	Ausman, Duane R.	St. Paul	Beek, Harvey O.	St. Paul
Ahrens, Curtis F.	Duluth	† Austrian, Sol	St. Paul	Beer, John J.	St. Paul
† Ahrens, Robert M.	St. Paul	† Autrey, William A.	St. Cloud	Behmler, Frederick Wm.	Morris
Akins, Willard M.	Red Wing	† Axler, Gueri	New York	Behr, Orlo K.	Crookston
Albrecht, Harold H.	Chisago City			Beirstein, Samuel	Minneapolis
Alcorn, William J.	Wabasso			Beiswanger, Richard H.	Minneapolis
Alden, John F., Jr.	St. Paul			Bell, Charles C.	St. Paul
Alden, W. Charles	Kimball			† Bell, Elexious T.	Minneapolis
Alexander, Harlan A.	Minneapolis			Bellomo, James	St. Paul
Aling, Charles A.	Minneapolis			† Bellomo, John	St. Paul
Allen, Edgar V. N.	Rochester			Bellville, Titus P.	Minneapolis
Allen, John H.	Montevideo			Belzer, Meyer S.	Minneapolis
† Allison, David D.	Duluth			Bender, James H.	Brainerd
Alpert, Abraham E.	Virginia			† Bendix, Lester H.	Annandale
Althausen, Theodore L., Jr.	Minneapolis			Benedict, William L.	Rochester
† Altnow, Hugo O.	Coral Gables, Fla.			Benell, Otto E.	Virginia
Alton, Donald G.	Bird Island			Benepe, James L.	St. Paul
Amatuzio, Donald S.	Minneapolis			Benesh, Louis A.	Minneapolis
† Amberg, Samuel	Rochester			Benjamin, Edwin G.	Minneapolis
† Ambrus, Laszlo	New York, N. Y.			Benjamin, Harold G.	Minneapolis
† Amerongen, W. W.	St. Paul			Benjamin, Walter G.	Pipestone
Amick, Lawrence D.	Rochester			Benson, Alfred H.	Little Falls
Andersen, Howard A.	Rochester			Benthack, Elaine M.	St. Paul
Andersen, Silas C.	Minneapolis			* Bentley, Norman P.	St. Paul
Andersen, Arden O.	Brainerd			Bepko, Marie K.	Cloquet
Andersen, Arnold S.	St. Louis Park			Berdez, George L.	Duluth
Andersen, Chester A.	Hector			Berg, Arnold M.	Roseau
Andersen, David M.	St. Louis Park			† Berg, Clinton C.	Wayzata
Andersen, David P.	Austin			Bergan, Robert O.	Duluth
† Andersen, Edward D.	Gstada, Switzerland			Berge, David O.	Roseau
Anderson, Edward M.	St. Cloud			Berge, Harry L.	Mora
Anderson, Ernest R.	Minneapolis			Berge, Kenneth G.	Rochester
Anderson, Frank J.	Minneapolis			Berger, Alex G.	Minneapolis
Anderson, Franklin C.	Owatonna			Bergh, George S.	Minneapolis
Anderson, Harold J.	Austin			Bergh, Solveig M.	Minneapolis
Anderson, James J.	Mankato			Berglund, Eldon B.	Minneapolis
Anderson, John A.	Minneapolis			Bergman, Oscar B.	St. James
Anderson, John T.	Minneapolis			Bergquist, James R.	Minneapolis
Anderson, John W.	Blue Earth			† Berkman, David M.	Oronoco
Anderson, Karl W.	Minneapolis			Berkman, John M.	Rochester
Anderson, Margaret C.	Mankato			Berkwitz, Nathaniel J.	Minneapolis
Anderson, Mark J.	Rochester			† Berman, Irwin B.	Rochester
Anderson, Markham J., Jr.	Rochester			Berman, Reuben	Minneapolis
Anderson, Milton W.	Rochester			† Berman, Stanley	Rochester
Anderson, Richard E.	Willmar			Bernatz, Philip E.	Rochester
Anderson, Richard W.	St. Paul			Bernier, M. J.	No. St. Paul
Anderson, Roger L.	Minneapolis			Bernstein, Irving C.	Minneapolis
Anderson, U. Schuyler	Minneapolis			Bernstein, William C.	St. Paul
Anderson, Waldo P.	Buffalo			Bessesen, Alfred N., Jr.	Minneapolis
Anderson, Wallace E.	Clearbrook			Bessesen, Daniel H.	Olivia
Anderson, Wallace E.	Minneapolis			Beuning, John B.	St. Cloud
Anderson, Wallace R.	Austin			Bevis, William D.	Minneapolis
Anderson, Werner W.	Brainerd			Bianco, Anthony J.	Duluth
Anderson, William H.	Minneapolis			† Bianco, Anthony J., Jr.	Rochester
Anderson, William T.	Minneapolis			Bieck, Joseph F.	St. Paul
Andreasen, Einar C.	St. Paul			Bickel, William H.	Rochester
Andreasen, Rolf L.	Minneapolis			† Biedermann, Jacob	Thief River Falls
Andresen, Karl D'A	Minneapolis			Bieter, Raymond N.	Minneapolis
Andrew, William F.	Duluth			† Bigelow, Charles E.	Dodge Center
Andrews, Robert S.	Minneapolis			† Bigg, Richard L.	Rochester
† Andrews, Roy N.	Mankato			Bigler, Earl E.	Perham
Ankner, Frank J.	Minneapolis			Bigler, Ivan E.	Perham
Anonsen, Richard E.	Minneapolis			Bilka, Paul J.	Minneapolis
Antonow, Arthur M.	Virginia			Billings, Ralph E.	Franklin
† Anzel, Sanford H.	Rochester			Binder, Manuel R.	Minneapolis
† Arends, Archabald L.	Minneapolis				
		Babb, Frank S.	St. Paul		
		Backus, Reno W.	Nopeming		
		Bacon, Donald K.	St. Paul		
		Badeaux, George I.	Brainerd		
		Bader, J. L.	Slayton		
		Baer, Walter	St. Paul		
		Baggenstoss, Archie H.	Rochester		
		Baggenstoss, Osmond J.	Minneapolis		
		Bagley, Charles M.	Duluth		
		Bagley, Elizabeth C.	Duluth		
		Bagley, Russell W.	Minneapolis		
		Bagley, William R.	Duluth		
		Baich, Velemir M.	Coleraine		
		Bair, Hugo L.	Rochester		
		Baird, Joseph W.	Minneapolis		
		Baird, Raymond L.	Lake Crystal		
		Baken, Melvin P.	Minneapolis		
		Baker, Abe B.	Minneapolis		
		† Baker, Alfred T.	Minneapolis		
		Baker, George S.	Rochester		
		† Baker, Harry R.	Hayfield		
		Baker, Hillier L., Jr.	Rochester		
		Baker, Jeannette L.	Fergus Falls		
		Baker, Milton E.	Minneapolis		
		Baker, Norman H.	Fergus Falls		
		Baker, Theodore, Jr.	Austin		
		Bakkila, Henry E.	Duluth		
		Balcome, Milton M.	St. Paul		
		Baleisis, Peter	Minneapolis		
		† Balfour, Donald C.	Rochester		
		Balkin, Samuel G.	Minneapolis		
		Balmer, Albert I.	Duluth		
		Balogh, Charles J.	Minneapolis		
		Bank, Harry E.	San Francisco, Calif.		
		Banner, Edward A.	Rochester		
		Barber, Tracy E.	Austin		
		Bardon, Richard	Duluth		
		Bargen, J. Arnold	Rochester		
		Barker, John D.	Duluth		
		Barker, Nelson W.	Rochester		
		Barnes, Arlie R.	Rochester		
		Barnes, Richard E.	Aurora		
		Barnett, Joseph M.	St. Paul		
		† Barney, Leon A.	Duluth		
		Barno, Alex.	St. Louis Park		
		† Baronofsky, Ivan D.	St. Paul		
		Barr, James S.	Elmore		
		Barr, Lowell C.	Albert Lea		
		Barr, Maxwell M.	Minneapolis		
		Barr, Robert N.	Minneapolis		
		Barr, Ronald W.	Montevideo		
		Barrett, Earl E.	Duluth		
		† Barron, Jesse J.	Minneapolis		
		† Barron, Moses	Minneapolis		
		Barron, S. Steven	Minneapolis		
		Barry, Maurice J., Jr.	Rochester		
		† Barsness, Nellie O. N.	St. Paul		
		† Bartholomew, Lee E.	Rochester		
		Bartholomew, Lloyd G.	Rochester		

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ALPHABETIC ROSTER

Coventry, William D.....Duluth
Covey, Kenneth W.....Rochester
Cowan, Donald W.....Minneapolis
Cowan, George M.....Duluth
Craig, Clair C.....International Falls
Craig, David M.....St. Paul
Craig, M. Elizabeth.....Minneapolis
Craig, Winchell McK.....Rochester
Cranmer, Richard R.....Minneapolis
Cranston, Robert W.....Minneapolis
Creedy, Charles D.....Minneapolis
* Critchfield, Lyman R.....St. Paul
Cronwell, Bernhard J.....Austin
Crowley, James H.....St. Paul
Crudo, Vincent D.....St. Paul
Crump, James W.....St. Paul
Culligan, John M.....St. Paul
Culligan, Leo C.....Minneapolis
Culp, Ormond S.....Rochester
Culver, L. G.....St. Paul
Cumming, E. Dale.....St. Paul
Cundy, Donald T.....Minneapolis
Curtis, Rauen A.....LeCenter
Cushing, Richard T.....St. Louis Park
Cushing, Robert L.....Brainerd
† Cutts, George.....Minneapolis

† Dady, Elmer E.....Minneapolis
Daehlin, Rolf.....Fergus Falls
Daggett, Donald R.....Minneapolis
Dahl, Elmer O.....Minneapolis
Dahl, James C.....Minneapolis
Dahl, John A.....Minneapolis
Dahlin, David C.....Rochester
† Daignault, Oscar.....Benson
Dale, Lester N.....Red Lake Falls
Daly, David.....Rochester
† Danford, Harold G.....Rochester
† Daniel, Donald H.....Minneapolis
† Danielson, Karl A.....Litchfield
† Danielson, Lennox.....Litchfield
† Danyluk, Michael.....Minneapolis
Dargay, Cyril P.....Minneapolis
Daugherty, Guy W.....Rochester
David, Reuben.....Hopkins
† Davis, Arthur E., Jr.....St. Paul
Davis, Edward V.....St. Paul
Davis, George D.....Rochester
Davis, Jay C.....Minneapolis
Davis, Lloyd T.....Wadena
Davis, Luther F.....Wadena
Davis, Raymond D.....Waseca
Davis, William I.....Mound
Dawson, James R.....St. Paul
Dawson, Lorin D.....Worthington
Dearing, William H.....Rochester
† Decker, Barry.....Rochester
Decker, Charles H.....St. Paul
Decker, David G.....Rochester
Degallier, Daniel.....Winona
DeGeest, James H.....Miller, So. Dak.
DeKruif, Hendrik.....Fergus Falls
† Delmore, John L.....Roseau
Delmore, John L., Jr.....Roseau
† Delmore, Robert J.....New Orleans, La.
del Plaine, Carlos W.....Minneapolis
Demo, Robert A.....Albert Lea
Derauf, Benjamin I.....St. Paul
Derauf, Donald E.....St. Paul
Deters, Donald C.....St. Paul
Detjen, Edward D.....Bigfork
Devereaux, Thomas J.....Wayzata
Devine, Kenneth D.....Rochester
† DeWall, Richard.....Minneapolis
DeWeerd, James H.....Rochester
Deweese, Wilford J.....Bemidji
Dewey, Donald H.....Owatonna
† Dickman, Roy W.....Monterey, Calif.
Dickson, Franklin H., Jr.....Proctor
*† Dickson, Thomas H.....St. Paul
Diefenbach, Eugene J., Jr.....Minneapolis
Diehl, Harold S.....Minneapolis
Dierker, Heinrich.....Minneapolis
Diessner, Ardell W.....Redwood Falls
Diessner, Grant R.....Rochester
Diessner, Henry D.....Minneapolis
† Dille, Donald E.....Igo, S. D.
Dines, David E.....Rochester
Dixon, Claude F.....Rochester
Doan, Robert E.....Wayzata
Dobler, Manfred D.....Ely
Dobson, Mervin W.....Mankato
Dockerty, Malcolm B.....Rochester
Docksey, John W.....Willmar
Dodds, William C.....Detroit Lakes
Dodge, Henry W., Jr.....Rochester
Doherty, Elmer M.....New Prague
Dokken, James H.....Windom
Doman, Victor Wm.....Lakefield
Doms, Vernon A.....Elbow Lake
Donaldson, Charles S.....St. Cloud
Donatelle, Edward P.....Minneapolis

† Donin, Jerry F.....Portsmouth, Virginia
Donoghue, Francis E.....Rochester
Donovan, Daniel L.....Albert Lea
Dordal, John.....Sacred Heart
Dorge, Richard I.....Minneapolis
*† Dornblaser, Harry B.....Los Gatos, Calif.
Dorsey, George C.....Minneapolis
Doscherholmen, Alfred.....Minneapolis
Douglass, Kenneth W.....Sandstone
Douglass, Bruce E.....Rochester
† Dovenmuehle, Robert H. Durham, N. C.
Downing, Fenworth M.....Worthington
Downing, William C.....Crookston
† Doxey, Gilbert L.....Minneapolis
† Doxsee, George C.....Iowa City, Iowa
Doyle, James R.....Rochester
Doyle, Lawrence O.....Minneapolis
Drake, Carl B.....St. Paul
† Drake, Charles R.....Minneapolis
† Dredge, Homer P.....Sandstone
† Dredge, Thomas E.....St. Cloud
Drexler, George W.....Blue Earth
Drill, Herman E.....Hopkins
† Drips, Della G.....Oronoco
* Dubbe, Frederick H.....New Ulm
† DuBois, Julian F.....Sauk Centre
† DuBois, Julian F., Jr.....Sauk Centre
Duff, Edwin R.....Minneapolis
Dummer, Donald J.....New Brighton
Duncan, James W.....Moorhead
Dungay, Neil S.....Northfield
Dunlap, Earl H.....Minneapolis
Dunn, James N.....St. Paul
Dunn, Robert C.....St. Paul
Dupont, Joseph A.....Excelsior
Durvea, Marby.....Minneapolis
Durvea, Willis M.....Minneapolis
Durvea, Willis M., Jr.....Minneapolis
DuShane, James W.....Rochester
Dvorak, Benjamin A.....Minneapolis
Dwan, Paul F.....Minneapolis
Dworsky, Samuel D.....Minneapolis
Dwyer, John J.....Duluth
Dyer, John Allen.....Rochester
Dyrdal, Paul J.....St. Paul
Dysterheft, Adolf F.....Gaylord

Earl, George A.....St. Paul
Earl, John R.....St. Paul
Eaton, Lealdes M.....Rochester
Eberley, Tobe S.....Benson
† Eberlin, Edward A.....Glenwood
Eckdale, John E.....Marshall
Eckman, Philip F.....Duluth
Eckman, Ralph J.....Duluth
Edelmann, Robert B.....Rochester
Eder, Walter P.....Minneapolis
Edwards, Jesse E.....Rochester
Edwards, Joseph W.....St. Paul
Edwards, Lloyd G.....St. Paul
Edwards, Thomas J.....St. Paul
† Edwin, Russell L.....Rochester
Egge, Janford G.....Albert Lea
Eginton, Charles T.....St. Paul
Ehrenberg, Claude J.....Minneapolis
Ehrlich, S. Paul.....Minneapolis
Eich, Matthew A.....Minneapolis
Eichhorn, Edmund P., Jr.....Minneapolis
Eide, O. A.....Hancock
Eiler, John.....Park Rapids
Eisenman, Walter.....Hibbing
Eisenstadt, David H.....Minneapolis
Eisenstadt, William S.....Minneapolis
Eitel, George D.....Minneapolis
† Ekblad, John W.....Rock Island, Ill.
Eklund, Carl D.....Duluth
Ekstrand, LeRoy M.....Wabasha
Eli, Earl W.....Minneapolis
Elias, Frank J.....Duluth
Elkins, Earl C.....Rochester
Ellertson, Leonard M.....Albert Lea
Ellinger, Albert J.....Willmar
Elliott, Harold J.....Hayfield
Ellis, Earl Wm.....Elgin
Ellis, F. Henry.....Rochester
Ellison, David E.....Minneapolis
Ellison, Ellis.....Minneapolis
Ellison, Frank E.....Monticello
Ellwood, Paul M., Jr.....Minneapolis
Elrod, Calvin R.....Long Lake
† Elsey, James R.....Glenwood
† Ely, Orriman S.....So. St. Paul
Emanuel, Karl W.....Duluth
Emerson, Edward C.....St. Paul
Emerson, Edwin E.....Osakis
Emmett, John L.....Rochester
Emmons, R. W.....St. Paul
Emond, Albert J.....Farmington
Emond, Joseph S.....Farmington
Endress, Edward K.....St. Paul
Engberg, Edward J.....Faribault

Engel, Joseph P.....Minneapolis
Engelhart, Peter C.....Minneapolis
Englund, Elvin F.....Minneapolis
Englund, Garth W.....Mabel
Engstrand, Oscar J.....Minneapolis
Engstrom, Denton P.....Minneapolis
Engstrom, Robert B.....Mankato
Enroth, Oscar E.....St. Paul
Eppard, Raymond M.....Cloquet
Erdal, Ove A.....Albert Lea
Erich, John B.....Rochester
Erickson, Alvin O.....Long Prairie
Erickson, Clifford O.....Minneapolis
Erickson, Donald J.....Rochester
Erickson, Eskil.....Halstad
Erickson, George P.....Hibbing
Erickson, Laurence F.....Minneapolis
Erickson, Myron E.....Minneapolis
Erickson, Reuben F.....Minneapolis
Erickson, Vernon D.....Grand Rapids
† Ericson, Swan.....Los Angeles, Calif.
Erlanson, Andrew C.....St. Paul
† Ernest, George C. H. St. Petersburg, Fla.
Ersfeld, Murray P.....St. Paul
Erskine, Gordon M.....Grand Rapids
† Ertel, Edward Q.....Ellendale
Esensten, Sidney.....Minneapolis
† Eshelby, E. C.....St. Paul
† Esser, Robert A.....Paris, France
Estes, J. Earle, Jr.....Rochester
Estrem, Ralph L.....Fergus Falls
Estrem, Robert D.....Fergus Falls
† Eusterman, George B.....Rochester
Eustermann, John J.....Mankato
Evans, Edward T.....Minneapolis
† Evans, Harold W.....Rochester
Evans, Leslie.....Sauk Rapids
Evans, Robert D.....Minneapolis
† Everts, Arrah B.....Rochester
Evansta, John B.....Grand Rapids
† Ewens, George B.....St. Paul

Faber, John E.....Rochester
† Fahr, George E.....Minneapolis
† Failor, Harlan J.....Rochester
Fallon, Virgil T.....Dawson
Falls, John L.....Red Wing
Fansler, Walter A.....Minneapolis
Farkas, John V.....St. Paul
Fasbender, Herman T.....Hastings
Faucett, Robert L.....Rochester
Faulconer, Albert, Jr.....Rochester
Fawcett, Arthur M.....Renville
Fawcett, Keith R.....Duluth
Fedor, Robert D.....Litchfield
Fee, John G.....St. Paul
Feeney, John M.....Minneapolis
Feigal, David W.....Wayzata
Feigal, William M.....Thief River Falls
Feinberg, Milton.....St. Paul
Feinberg, Philip.....Minneapolis
Feinberg, Samuel B.....Minneapolis
† Feinberg, Walter D.....Rochester
Feinstein, Julius Y.....Minneapolis
Feldner, Davitt A.....St. Paul
Feldmann, Floyd M.....New York, N. Y.
Felon, Arthur J.....St. Paul
Fellows, Manley F.....Duluth
Fenger, Ejvind P. K.....Oak Terrace
Ferguson, William C.....Walnut Grove
Ferrand, Paula T.....Moose Lake
Ferrell, Clarence R.....Grand Rapids
Ferris, Deward O.....Rochester
Fesenmaier, Otto B.....New Ulm
Fesler, Harold H.....St. Paul
Fetzek, Albert D.....Austin
Feuling, John C.....Duluth
Fidelman, Norman E.....Foley
Field, Anthony H.....Farmington
Field, Charles W.....Minneapolis
Fifer, William R.....St. Paul
Fifield, Malcolm M.....Duluth
Figi, Frederick A.....Rochester
Fingerman, David L.....Minneapolis
Fink, Daniel L.....St. Paul
Fink, Leo W.....Minneapolis
Fink, Robert J.....Minneapolis
Fink, Walter H.....Minneapolis
Finkelnburg, William O.....Winona
Fisch, Herbert M.....Austin
Fischer, John R.....Blooming Prairie
Fischer, Mario McC.....Duluth
Fischer, Robert F.....St. Paul
Fisher, Dan W.....St. Paul
Fisher, Isadore I.....Minneapolis
Fisketti, Henry.....Duluth
† Fitzgerald, Don F.....Wayzata
Fitzsimons, William E., Jr.....Brainerd
† Fieldstad, C. Alford.....Minneapolis
Flanagan, Harold F.....St. Paul
Flanagan, Leonard G.....Austin
Flancher, Leon H.....Crookston

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Harrison, Gaius E.	St. Paul	Hermann, Harold W.	Minneapolis	Hughes, Bernard J.	Brainerd
Harrington, Stuart W.	Rochester	Hermanson, Peter E.	Hendricks	Hughes, Sidney O.	Winona
Harrington, Vernon A., Jr.	Duluth	Herrmann, Edgar T.	St. Paul	Huizenga, Kenneth A.	Rochester
* Harris, Carl N.	Hibbing	† Hertel, Garfield E.	Austin	Hullisiek, Harold E.	St. Paul
Harris, Leon D.	Minneapolis	Hertz, Myron J.	St. Paul	Hullisiek, Richard B.	Fort Snelling
Harris, Lloyd E.	Rochester	Hesla, Inman A.	Austin	Hulteng, Donald B.	Minneapolis
Harrison, Percy W.	Worthington	† Hewitt, Edith S.	Rochester	Hultkrans, Rudolph E.	Minneapolis
Harrison, William C.	Minneapolis	† Hewitt, Richard M.	Rochester	Humphrey, Edward W.	Moorhead
Harshbarger, Harry G.	Rochester	† Heyerdale, Oscar C.	Rochester	† Humphrey, Wade R.	Stillwater
Hart, William E.	Monticello	Higgins, John A.	Rochester	Hunt, Arthur B.	Rochester
Hartfiel, William F.	St. Paul	† Higgins, John H.	Minneapolis	† Hunt, Roscoe C.	Clearwater Beach, Fla.
Hartig, Marjorie.	St. Paul	Hildebrand, John E.	Bemidji	Hunt, William	Fergus Falls
Hartjen, Jason K.	Bemidji	Hilding, Anderson C.	Duluth	Hunter, James S., Jr.	Rochester
*† Hartley, Everett C.	St. Paul	† Hilger, Andrew Wm.	St. Paul	Hunter, Murray H.	Farmington
Hartman, Evelyn E.	Minneapolis	Hilger, Jerome A.	St. Paul	† Hurd, Annah	Minneapolis
† Hartman, Howard R.	Rochester	Hilger, Laurence D.	St. Paul	Hurwitz, Milton M.	St. Paul
Hartnagel, Grant F.	Red Wing	Hilgermann, George O.	Minneapolis	Husebye, Kjeld O.	St. Paul
Hartridge, Virginia B.	Rochester	Hilker, Marcus D.	St. Paul	Hustad, Edward G.	Montevideo
Hartung, Elmer H.	Claremont	Hill, Earl.	Minneapolis	Hutchinson, Dorothy W.	Oak Terrace
Hartwich, Roger F.	Winona	Hill, Elmer M.	Minneapolis	Hutchinson, Henry	Moose Lake
† Hartwig, John A.	Rochester	† Hill, Frederick E.	Riverside, Calif.	† Huxley, Frederick R.	Faribault
Hass, Frederick M.	Minneapolis	† Hill, John P.	Chicago, Ill.	Hymes, Charles	Minneapolis
† Hassel, Carl W., Jr.	Rochester	Hill, John R.	Rochester	† Hynes, John E.	Minneapolis
Hassett, Roger G.	Mankato	Hill, Richard Woolsey	Rochester		
Hastings, DeForest R.	Minneapolis	† Hillis, Samuel J.	Minneapolis		
Hastings, Donald W.	Minneapolis	Hinckley, Robert G.	Minneapolis		
† Hatch, Walter E.	Duluth	Hinderaker, Harris P.	Bird Island		
Hauge, Erling T.	Minneapolis	Hines, Edgar A., Jr.	Rochester	† Ide, Arthur W.	St. Paul
Hauge, Malvin I.	Clarkfield	Hiniker, Louis P.	St. Paul	Ide, Arthur W., Jr.	Minneapolis
Haugen, George W.	Minneapolis	Hiniker, Peter J.	Le Sueur	Idstrom, Linneus G.	Minneapolis
Haugen, John A.	Minneapolis	Hinz, Walter E.	Willmar	Ikeda, Kano.	St. Paul
Hauser, Donald C.	Minneapolis	Hirschboeck, Frank J.	Duluth	Indeck, Walter	Minneapolis
Hauser, George W.	Minneapolis	Hirsh, Stanton A.	Crookston	† Indihar, John E., Jr.	Minneapolis
Hauser, Victor P.	St. Paul	Hirshfield, Frank R.	Minneapolis	*† Ingerson, Carl A.	St. Paul
Havel, Robert J.	Minneapolis	Hitchcock, Claude R.	Minneapolis	Inglis, William	Redwood Falls
Haven, Walter K.	Minneapolis	Hochfilzer, John J.	St. Paul	Ireland, Gerald W.	Nashauk
† Havens, Fred Z.	Riverside, Calif.	Hodapp, Robert V.	Willmar	† Irvine, Harry G.	Minneapolis
† Havens, John G. W.	Austin	Hodgson, Corrin H.	Rochester	Iverson, Rolf M.	Minneapolis
Hawkinson, Raymond P.	Minneapolis	Hodgson, Jane E.	St. Paul	Ivins, John C.	Rochester
Hawley, George M. B., II.	Red Wing	Hodgson, John R.	Rochester	Ivy, Horace K.	Rochester
Hay, Lyle J.	Minneapolis	Hoepfer, Philip G.	Mankato		
Hayes, Albert F.	St. Paul	Hoff, Herbert O.	Duluth		
† Hayes, James M.	Arcadia, Calif.	Hoffbauer, Frederick W.	Minneapolis	Jackman, Raymond J.	Rochester
Hayles, Alvin B.	Rochester	Hoffert, Henry E.	Minneapolis	Jackson, William C.	St. Paul
Hays, Albert T.	Minneapolis	Hoffman, Roy A.	Minneapolis	Jacobs, Douglas L.	Willmar
Head, Douglas P.	Minneapolis	Hoffman, Walter L.	Minneapolis	† Jacobs, Johannes C.	Willmar
Hebbel, Robert	Minneapolis	Hoganson, Donald E.	Bemidji	Jacobson, Clarence	Chisholm
Hebeisen, Milton B.	Carver	† Hoidale, Andrew D.	Tracy	Jacobson, Clifford W.	Breckenridge
Heck, Frank J.	Rochester	† Holcomb, Joel T.	Marine-on-St. Croix	Jacobson, Ferdinand C.	Duluth
Heck, William W.	St. Paul	† Holcomb, O. Wm.	St. Paul	Jacobson, Loren J.	Minneapolis
* Hedberg, Gustaf A.	Nopemeng	Holian, Darwin K.	Albert Lea	Jacobson, Wyman E.	St. Louis Park
Hedemark, Homer H.	Ortonville	Holland, C. R.	Rochester	James, Ellery M.	St. Paul
Hedemark, Truman A.	Ortonville	*† Hollands, William H.	Fisher	James, John W.	Mahtomedi
Hedenstrom, Frank G.	St. Paul	Hollenhorst, Robert W.	Rochester	Janecky, Allen G.	Baudette
Hedenstrom, Paul H.	Cambridge	Hollinshead, W. H.	St. Paul	Janes, Joseph M.	Rochester
Hedenstrom, Philip C.	Marshall	Holm, Donald F.	Benson	Janssen, Martin E.	St. Paul
† Hedrick, William L.	Rochester	Holman, Colin B.	Rochester	† Jarvis, Bruce W.	St. Paul
Heegaard, William G.	Alexandria	Holmberg, Conrad J.	Minneapolis	Jarvis, Charles W.	St. Paul
† Hegge, Olav H.	Austin	† Holmberg, Le Roy J.	Canby	Jarvis, Marilyn A.	St. Paul
Heiam, William C.	Cook	Holmen, Robert W.	St. Paul	Jarvis, Walter H., Jr.	Rochester
Heiberg, Emmett A.	Fergus Falls	Holmes, Alva E.	Rush City	Jastram, Rupert M.	St. Paul
Heiberg, Olaf M.	Worthington	Holmstrom, Carl H.	Warren	Jay, Alan R.	Minneapolis
Heilig, William R.	St. Paul	Holt, John E.	St. Paul	Jefferies, William L.	St. Louis Park
† Heilman, Dorothy M. H.	San Diego, Calif.	Holzappel, Fred C.	Minneapolis	Jensen, Alvin M.	Brownston
Heilman, Fordyce R.	Rochester	Hom, Leong Y. W.	Battle Lake	Jensen, Harry C.	Minneapolis
Heimark, John J.	Mankato	Honath, Donald H.	Owatonna	Jensen, John A.	Crookston
Heimark, Julius J.	Fairmont	† Hooker, John P.	Rochester	† Jensen, Marius J.	Minneapolis
Heinz, Ivy B.	Shakopee	† Hooper, Worth A.	Long Beach, Calif.	Jensen, Nathan K.	Minneapolis
Heinz, Lawrence H.	Shakopee	† Hoover, Norman W.	Rochester	Jensen, Reynold A.	Minneapolis
Heinzerling, Carl R.	Chaska	Hopkins, G. Wendell.	St. Paul	Jensen, Thorvald J.	Duluth
Heise, Carl vR.	Winona	Hoppes, Emerson E.	Minneapolis	Jenson, James E.	Stillwater
Heise, Herbert vR.	Winona	Horns, Howard L.	Minneapolis	Jerome, Bourne	Minneapolis
Heise, Paul vR.	Winona	Horns, Richard C.	Minneapolis	Jerome, Elizabeth K.	Minneapolis
Heise, Philip vR.	Winona	Horton, Bayard T.	Rochester	Jeronimus, Henry J.	Duluth
Heise, William vR.	Winona	Hottinger, Raymond C.	Janesville	† Jesion, Joseph W.	Pine River
† Helland, John W.	Spring Grove	Hougum, Arvid J.	Lake Park	Jessico, Charles M.	Duluth
Heller, Edgar E.	Mankato	Houkom, Bjarne	Minneapolis	Jeub, Robert P.	Minneapolis
† Helmholtz, Henry F.	Rochester	Houkom, Samuel S.	Duluth	Joffe, Harold H.	Virginia
Helsteth, Hovald K.	Fergus Falls	Houle, Rollin J.	New Brighton	Johanson, Waldemar G.	St. Paul
Helwig, Karl L., Jr.	Kerkhoven	*† House, Zachariah E.	Burbank, Calif.	Johnsen, Henry A., Jr.	Edina
Hempel, Dean J.	Minneapolis	Houston, Donald M.	Park Rapids	Johnson, Aldridge F.	Isle
† Hempstead, Bert E.	Rochester	Houts, Joseph C.	Dassel	Johnson, Angelo G.	Minneapolis
Hench, Philip S.	Rochester	Hovde, Rolf.	Winthrop	Johnson, Arthur B.	Minneapolis
Henderson, Arthur J. G.	No. St. Paul	Hovland, Melvin L.	Minneapolis	* Johnson, August E.	Minneapolis
Henderson, Edward D.	Rochester	† Howard, Frank M., Jr.	Rochester	Johnson, Carl E.	St. Paul
Henderson, John W.	Rochester	Howard, Marshall I.	Mankato	Johnson, Carl E.	Rochester
Henderson, Lowell L.	Rochester	Howard, Merrill A.	St. Paul	Johnson, Carolyn A.	St. Paul
Hendricks, Esten J.	Verndale	Howard, Robert B.	Minneapolis	Johnson, C. Percy.	Tyler
† Hedrickson, John F.	Minneapolis	Howard, Solomon E.	Minneapolis	Johnson, David R.	Minneapolis
Hengstler, William H.	St. Paul	Howe, Newell W.	St. Paul	Johnson, Douglas L.	St. Paul
† Henriksen, Earl C.	Minneapolis	Howell, Carter W.	Minneapolis	† Johnson, Edward A.	St. Paul
Henry, Clarence J.	Milaca	Howell, Llewelyn P.	Rochester	Johnson, Einer W.	Bemidji
† Henry, Clifford E.	Kirksville, Mo.	Howell, Milton M.	Glencoe	Johnson, Einer W., Jr.	Rochester
Henry, Harold W.	Hinckley	† Howland, Willard J.	Rochester	Johnson, Frank E.	Minneapolis
Henry, Joseph E.	Milaca	Hoyer, Ludolf J.	Windom	Johnson, Harry A.	Minneapolis
Henry, Kenneth G.	Owatonna	Hruza, William J.	Madelia	Johnson, Herbert W.	St. Paul
Henry, Martin R.	St. Peter	Hubin, Edwin G.	Sandstone	Johnson, Hobart C.	No. Mankato
† Hensel, Charles N.	St. Paul	Hudec, Elwyn R.	Echo	† Johnson, James A.	Minneapolis
Hepper, Norman G.	Rochester	Hudson, George E.	Minneapolis	Johnson, John W.	Minneapolis
Herbert, Edna E.	Rochester	† Huebert, Dan W.	Hutchinson	† Johnson, Julius.	Minneapolis
Herbert, Willis L.	Minneapolis	† Huenekens, Edgar J.	Minneapolis	Johnson, Karl E.	Duluth
Herbst, Richard F.	Willmar	Huff, J. S.	Owatonna	Johnson, Malcolm R.	Minneapolis
Herman, Samuel M.	St. Paul	† Huffington, Herbert L.	Lutsen		
		Huffington, Herb L., Jr.	Waterville		

ALPHABETIC ROSTER

Johnson, Marvin W.....	Dassel	Kemper, James W.....	Rochester	Kuske, Albert W.....	St. Paul
Johnson, Norman P.....	Minneapolis	Keneff, Emmett V.....	St. Paul	† Kusske, Arthur L.....	New Ulm
Johnson, Norman Paul.....	Minneapolis	† Kennedy, Claude C.....	Minneapolis	Kusske, Bradley W.....	St. Paul
Johnson, Norton T.....	Minneapolis	Kennedy, George L.....	Faribault	Kusske, Douglas R.....	St. Paul
Johnson, Olga H.....	Moorhead	† Kennedy, Jane F.....	Minneapolis	Kusz, Clarence V.....	Minneapolis
Johnson, Orville H.....	Edina	Kennedy, Roger L. J.....	Rochester	Kuykendall, Sam J.....	Rochester
Johnson, R. J.....	St. Paul	Kenyon, Thomas J.....	St. Paul	Kvale, Walter F.....	Rochester
Johnson, Ralph B.....	Lanesboro	Kerkhof, Arthur C.....	Minneapolis	Kvitrud, Gilbert.....	St. Paul
Johnson, Ray A.....	New York, N. Y.	Kernohan, James W.....	Rochester		
Johnson, Reinold G.....	Minneapolis	Kesting, Herman.....	St. Paul		
Johnson, Reuben A.....	Minneapolis	Kevern, Jay L.....	Henning		
Johnson, Richard S.....	Minneapolis	Keyes, John D.....	Winona	LaBree, John W.....	St. Louis Park
Johnson, Robert E.....	Minneapolis	Keyes, Robert W.....	Pipestone	LaBree, Robert H.....	Duluth
Johnson, Robert H.....	Chisago City	Kibler, Charles E.....	Rochester	LaFond, Edward M.....	St. Cloud
Johnson, Roger S.....	Wayzata	Kiely, Joseph M.....	Rochester	† Lagaard, Sheldon M.....	Minneapolis
Johnson, Ronald G.....	Coronado, Calif.	Kierlund, Robert R.....	Rochester	Laikola, Leslie A.....	Adrian
Johnson, Vilhelm M.....	Dawson	Kiely, Frank, Jr.....	Minneapolis	† Laird, Arthur T.....	Duluth
Johnson, William E.....	Morgan	Kilbride, Edwin A.....	Worthington	† Lajoie, John M.....	Minneapolis
Johnson, William J.....	Rochester	Kim, Mark K.....	St. Cloud	Lake, Clifford F.....	Rochester
Johnson, Youbert T.....	Minneapolis	Kimmel, George C., Jr.....	Red Wing	Lamb, H. Douglas.....	Minneapolis
Johnsrud, Luverne W.....	Hibbing	Kincaid, Owings W.....	Rochester	Lang, Leonard A.....	Minneapolis
Johnston, Henry W.....	Virginia	* † King, Edgar A.....	Minneapolis	† Langhoff, Arthur H.....	La Crosse, Wisc.
Johnston, Leonard F.....	Winona	King, Frances W.....	Oak Terrace	Langrall, Harrison M.....	Rochester
Jolin, Francis M.....	Grand Rapids	† King, George L.....	Hudson, Wis.	Lannin, Bernard G.....	St. Paul
Jones, Alvah W.....	Red Wing	Kinkade, Byron R.....	Ada	Lannin, Donald R.....	St. Paul
Jones, David G.....	Minneapolis	Kiports, Edward B.....	International Falls	† Lapiere, Arthur P.....	Minneapolis
Jones, E. Mendelssohn.....	St. Paul	Kinsella, Thomas J.....	Minneapolis	* Lapiere, Jean T.....	Minneapolis
Jones, Herbert W., Jr.....	Minneapolis	Kiolbasa, Edward B.....	Stillwater	Larrabee, Walter F., Jr.....	St. Paul
Jones, Orville H.....	Mankato	Kippen, Neil.....	Breckenridge	Larsen, Frank Wm.....	Minneapolis
Jones, Richard H.....	Minneapolis	Kirby, Thomas J., Jr.....	Rochester	Larson, Arnold.....	Detroit Lakes
Jones, Richard N.....	St. Cloud	* † Kirklin, Byrl R.....	Rochester	Larson, Arthur N.....	Madison
Jones, William R.....	Minneapolis	Kirklin, John W.....	Rochester	Larson, Clarence M.....	Minneapolis
Jordan, Kathleen B. Smith.....	Granite Falls	† Kistler, Alvin J.....	Minneapolis	Larson, Donald M.....	Minneapolis
Jordan, Lewis S.....	Granite Falls	† Kitzberger, Peter J.....	New Ulm	† Larson, Donald M.....	Minneapolis
Josewich, Alexander.....	Minneapolis	† Klass, Donald W.....	San Antonio, Tex.	Larson, Dorette W.....	Madison
Josewski, Raymond J.....	Stillwater	Klefsstad, Lloyd H.....	Greenbush	Larson, Eva-Jane.....	St. Paul
Joyce, George L.....	Rochester	Klein, Harry.....	Duluth	Larson, Gerald E.....	Cambridge
Judd, Allen S.....	Minneapolis	* † Klein, Henry N.....	St. Paul	Larson, James T.....	So. St. Paul
Judd, Edward S., Jr.....	Rochester	Klein, William A.....	Duluth	Larson, Keith D.....	Moose Lake
Judd, Walter H.....	Washington, D. C.	† Klima, William W.....	Stewart	Larson, Kenneth R.....	St. Paul
Juergens, Herman M.....	Belle Plaine	† Kline, Richard F.....	Minneapolis	Larson, Lawrence M.....	Minneapolis
Juergens, John L.....	Rochester	Knapp, Frank N.....	Duluth	Larson, Leighton W.....	Waconia
Juergens, Manley F.....	Stillwater	Knapp, Miland E.....	Minneapolis	Larson, Leonard J.....	Oak Terrace
Juers, Edward H.....	Red Wing	* Knight, Edwin G.....	Swanville	Larson, Leroy J.....	Bagley
Juliar, Richard O.....	Los Angeles, Calif.	† Knight, Ralph T.....	Minneapolis	Larson, Martin L.....	St. Paul
Juntunen, Roy R.....	Duluth	† Knight, Ray R.....	Minneapolis	Larson, Milo H.....	Lake Benton
Jurdy, Mitchell J.....	Minneapolis	† Knoche, Harvey A.....	Morgan	Larson, Oliver E. H.....	Zumbrota
Just, Herman J.....	Hastings	Knoedler, John P.....	Duluth	Larson, Paul N.....	Minneapolis
		Knoll, W. V.....	Crosby	* Larson, Ralph H.....	Anoka
		Knudsen, Helen L.....	Minneapolis	† Larson, Roger C.....	Minneapolis
		Knutson, Gerhard E.....	St. Paul	Larson, W. G.....	Northfield
		Knutson, Kenneth R.....	Hibbing	Laszewski, Franz von Zelberschwecht	St. Paul
		Knutson, Lewis A.....	Spring Grove		
		Knutson, Robert C.....	St. Paul	Latterell, Kenneth E.....	Duluth
		Kodres, Nina.....	St. Paul	† LaVake, Rae T.....	Minneapolis
		Koelsche, Giles A.....	Rochester	Law, Harrison E.....	Virginia
		Koenecke, F. H.....	Lakefield	* Lax, Morris H.....	St. Paul
		† Koenig, Robert P.....	Unknown	Laymon, Carl W.....	Minneapolis
		Koenigsberger, Charles.....	Mankato	Lazarte, Jorge A.....	Rochester
		Koeppcke, Gerald M.....	Minneapolis	† Leahy, Bartholomew.....	St. Paul
		Kohlbray, Carl O.....	Duluth	Leavenworth, Richard O.....	St. Paul
		† Kohler, Delphin W.....	Tacoma, Wash.	Leavenworth, Richard O., Jr.....	St. Louis Park
		Kohlhase, Robert E.....	Minneapolis	* † Lebowske, Joseph A.....	Minneapolis
		Kolars, James J.....	Faribault	† LeClair, J. Maurice.....	Rochester
		Koller, Hermann M.....	Minneapolis	Leck, Paul C.....	Austin
		Koller, Louis R.....	Minneapolis	Lee, Gordon E.....	Glenwood
		Koller, Robert L.....	Minneapolis	Lee, Hubert W.....	Brainerd
		Kooda, Jennings C.....	Morris	Lee, Norman J.....	Tracy
		Koop, Herman E.....	Cold Spring	Leek, Joseph H.....	Duluth
		Korchik, John P.....	Minneapolis	Leemhuis, Andrew J.....	Minneapolis
		Korda, Henry A.....	Pelican Rapids	Leibold, Herbert H.....	Parkers Prairie
		Kosiak, John Jr.....	Minneapolis	Leick, Richard M.....	St. Paul
		Kosiak, William.....	Two Harbors	Leiferman, Robert J.....	Minneapolis
		Kostick, William R.....	Fertile	† Leigh, John E.....	Rochester
		Kotchevar, Frank R.....	Eveleth	Leinonen, Wendla E.....	Wadena
		Kottke, Frederic J.....	Minneapolis	Leitch, Archibald.....	St. Paul
		Kotval, Russell J.....	Pipestone	Leland, Harold R.....	Minneapolis
		Koucky, Rudolph W.....	Minneapolis	Lenander, Melvin E.....	St. Peter
		† Kovack, Freeman D.....	Amarillo, Tex.	Lenarz, Albert J.....	Browerville
		Koza, Donald W.....	St. Paul	Lende, Norman.....	Faribault
		Kozberg, Oscar.....	Moose Lake	Lenz, Joseph R.....	Morton
		Kraemer, George N.....	Fairmont	Lenz, O. A.....	Minneapolis
		Kraft, Walter E.....	Minneapolis	Leonard, Lawrence J.....	Minneapolis
		† Kragh, Lyle V.....	Rochester	Leonard, Samuel.....	Minneapolis
		Krause, Carl W.....	Fairmont	† Leopard, Brand A.....	Brownsville, Tex.
		Kremen, Arnold J.....	Minneapolis	Lepak, Francis J.....	Duluth
		Kreuzer, Titus C.....	Marshall	Lepak, John A.....	St. Paul
		Kreowski, Thomas K.....	St. Paul	Leppo, N. Erkki A.....	Duluth
		Krieser, Albert E.....	Minneapolis	† Lerche, William.....	Cable, Wis.
		Kroll, Harry G.....	Unknown	Lerner, A. Ross.....	Minneapolis
		Krueger, Victor R.....	Nopeming	L'Esperance, Bernard F.....	Two Harbors
		Kruger, Victor R.....	Nashauk	Lester, Malcolm.....	Truman
		Krusen, Frank H.....	Rochester	Lester, Richard G.....	Minneapolis
		Kruzich, Stephen J.....	Sleepy Eye	† Letson, Robert D.....	Glenwood
		† Krystosek, Lee A.....	Madison, Wisc.	Leven, N. Logan.....	St. Paul
		Kucera, Frank J.....	Hopkins	Leverenz, Carleton W.....	St. Paul
		Kucera, Stanley T.....	Northfield	Levitt, George X.....	St. Paul
		Kucera, William J.....	Minneapolis	Lewis, Arthur J.....	Henning
		Kugler, Alex A.....	St. Paul	Lewis, Charles W.....	Henning
		Kuhlmann, Lawrence B.....	Melrose	* † Lewis, Claude B.....	St. Cloud
		Kulstad, Oscar S.....	Dodge Center	Lewis, F. John.....	Wilmette, Ill.
		Kulzer, Norbert J.....	Hastings	† Lewis, Joyce S., Jr.....	Minneapolis
		† Kurtin, Joseph J.....	New York, N. Y.	† Lexa, Frank J.....	Lonsdale

ALPHABETIC ROSTER

Lick, Charles L.	St. Paul	McBean, James B.	Rochester	Mark, Hilbert	St. Paul
Lick, Louis C.	St. Paul	McCabe, James S.	St. Paul	Marking, George H.	Minneapolis
Lick, William J., Jr.	St. Paul	McCaffrey, F. John	Minneapolis	Marks, Roger W.	St. Paul
† Liedloff, Adolph G.	Mankato	McCain, Donovan L.	St. Paul	Marrone, Patrick H.	Duluth
Lien, Richard J.	St. Paul	McCampbell, Malcolm D.	Minneapolis	Marshall, Clark M.	Crosby
Lienke, Roger I.	Minneapolis	McCannel, Malcolm A.	Minneapolis	Martens, Theodore G.	Rochester
Liffing, William W.	Red Wing	McCarten, Francis M.	Stillwater	Martin, Albert C.	Luverne
† Lightbourn, Edgar L.	Hastings	McCarthy, Austin M.	Willmar	Martin, Dwight L.	St. Paul
Lilleberg, Norbert J.	St. Paul	McCarthy, Donald	St. Paul	Martin, Frank E.	Minneapolis
Lillehei, C. Walton	Minneapolis	McCarthy, Joseph J.	St. Paul	Martin, George B.	Thief River Falls
Lillehei, Elmer J.	Robbinsdale	McCartney, James S.	Minneapolis	Martin, George R.	Minneapolis
† Lillie, Harold I.	Rochester	*† McCarty, Paul D.	Tower	Martin, Gordon M.	Rochester
Lillie, John C.	Rochester	† McClanahan, James H.	White Bear Lake	† Martin, Maurice J.	Rochester
Lima, Ludvig R., Jr.	Montevideo	† McClanahan, Thomas S.	White Bear Lake	† Martin, Thomas Philip	Arlington
Limbeck, Donald A.	LeSueur	McCleary, Jack E.	Rochester	Martin, Webster C.	Duluth
‡ Lind, Carl J., Jr.	Washington, D. C.	McClellan, Robert J.	Unknown	Martin, William B.	Duluth
Lindahl, Merlyn J.	Sherburn	McCloed, Charles N., Jr.	St. Paul	Martin, William J.	Rochester
Lindberg, Alfred L.	Wheaton	McClure, Rensselaer W., Jr.	Rochester	Martinson, Joseph L.	St. Paul
Lindberg, Arthur N.	Minneapolis	McConahey, William M., Jr.	Rochester	Martinson, Carl J.	Wayzata
† Lindberg, Arvid C.	Minneapolis	McCormick, Donald P.	Minneapolis	Martinson, Elmer J.	Wayzata
Lindberg, Vernon L.	Minneapolis	McCown, Louis K.	Rochester	Massarelli, John J., Jr.	Rochester
Lindberg, Winston R.	Minneapolis	† McCoy, Mary K.	Duluth	Masson, Duncan M.	Rochester
Lindblom, Alton E.	North Mankato	† McDaniel, Orianna	Minneapolis	† Masson, James C.	Rochester
Lindblom, Maurice L.	Minneapolis	McDaniel, S. P.	Lakeville	Masson, James K.	Rochester
† Linde, Herman	Cyrus	† McDonald, Archibald L.	Unknown	Mast, Frederic L.	Chisholm
Lindell, Robert	St. Paul	† McDonald, John R.	Rochester	Mateo, Guillermo	St. Paul
Lindeman, Raymond J.	Paynesville	McDonald, Owen G.	Duluth	Mathieson, Don R.	Rochester
Lindemann, Charles E.	Minneapolis	† McDowell, John P.	St. Cloud	Mathews, James H.	Minneapolis
Linderholm, Bruce E.	Minneapolis	McEnaney, Clifford T.	Owatonna	Mattill, Peter M.	Oak Terrace
Lindgren, Russell C.	Minneapolis	McEwan, Alexander	St. Paul	Mattison, Percy A.	Winona
Lindner, Janus C.	Minneapolis	McFarland, Arthur H.	Minneapolis	Mattson, Albert D.	St. James
Lindquist, Richard H.	Minneapolis	McGandy, Robert F.	Minneapolis	Mattson, Hamlin A. N.	Minneapolis
Linner, Gunnar	Minneapolis	McGeary, George E.	Minneapolis	Maunders, John B.	Minneapolis
† Linner, Henry P.	Minneapolis	McGroarty, Brian J.	St. Paul	Maus, Philip W.	Dawson
Linner, John H.	Minneapolis	† McGroarty, John J.	Easton	† Maxeiner, Stanley R.	Minneapolis
Linner, Paul W.	Minneapolis	McHaffie, Orval L.	Duluth	Maxeiner, Stanley R., Jr.	Minneapolis
† Lipinski, Stanley W.	Memphis, Tenn.	McIlhany, Mary Lou	Wheeler, Tex.	† Mayberry, William E.	Rochester
Lippman, Emanuel S.	Minneapolis	McInerny, Maurice W.	Minneapolis	Mayne, John Gregory	Rochester
Lippman, Hyman S.	St. Paul	*† McIntire, Homer M.	Waseca	Mayne, Roy M.	Nopemng
Lippman, Elmer W.	Hutchinson	McIntyre, John A.	Owatonna	Mayo, Charles W.	Rochester
Lipschultz, Oscar	Minneapolis	McKaig, Alan M.	Red Lake Falls	Mazzitello, William F.	St. Paul
Lipscomb, Paul R.	Rochester	McKaig, Carle B.	Pine Island	† Mead, Charles H.	Duluth
† Litchfield, John T.	Minneapolis	McKay, John W.	Rochester	Meade, John R.	St. Paul
Litin, Edward M.	Rochester	McKelvey, John L.	Minneapolis	Mears, Burtis J.	St. Paul
Litkewitsch, Helene	St. Paul	McKenna, Elizabeth M.	Austin	Mears, Robert F.	Northfield
Litman, Abraham B.	Minneapolis	McKenna, Jay K.	Austin	Medelman, John P.	St. Paul
Litman, Samuel N.	Duluth	McKenna, John J.	Virginia	Meinert, Albert E.	Winona
Litzow, Thaddeus J.	Rochester	McKenna, Maurice J.	Grand Rapids	Meinert, John K.	Willmar
Lober, Paul H.	Minneapolis	McKenzie, Charles H.	Minneapolis	Melancon, Joseph F.	St. Paul
Loes, Louis A.	St. Cloud	McKenzie, Eva E.	St. Paul	† Melby, Benedic	Bloomington
Lofgren, Karl A.	Rochester	McKinlay, Chauncey A.	Minneapolis	Meller, Maurice	Brainerd
Lofness, Stanley V.	St. Paul	McKinney, Frank S.	Minneapolis	Meller, Robert L.	Minneapolis
Lofstrom, Dennis E.	Pine River	McLane, William O.	Brainerd	† Melzer, George R.	Lyle
† Logan, Archibald H.	Rochester	McLaughlin, Byron H.	Minneapolis	Menefee, Edward C.	Albert Lea
Logan, George B.	Rochester	† McLaughlin, Edmund M.	Winona	Menguy, René B.	Rochester
† Logeheil, Rudolph C.	Minneapolis	McManus, William F.	Princeton	Menold, William F.	St. Paul
Lohmann, John G.	Pipestone	McMurtree, William B.	Minneapolis	Mensheha, Nicholas	Forest Lake
Loken, Selmer M.	St. Paul	McNear, George R., Jr.	Mankato	Mercil, William F.	Crookston
Loken, Theodore	Ada	McNeil, John J.	Minneapolis	Merkert, Charles E.	Minneapolis
Lommen, Peter A.	Austin	McNeil, Maurice R.	Glencoe	Merkert, George L.	Minneapolis
Lommen, Peter A., Jr.	Austin	McNeill, J. A.	St. Paul	Merner, Thomas B.	Faribault
† Long, Fred M.	Rochester	McNutt, John R.	Duluth	† Merrick, Charlotte T.	St. Paul
Longfellow, Helen W.	Brainerd	McPheeters, Herman O.	Minneapolis	Merrick, Robert L.	St. Paul
† Loomis, Earl A.	Minneapolis	† McQuarrie, Irvine	Minneapolis	Merrill, Robert W.	Morris
Loomis, George L.	Winona	McQuarrie, Collin S.	Rochester	Merriman, Lloyd L.	Duluth
Lorentzen, Ernest S.	Detroit Lakes	† MacCarty, William C.	Rochester	Merritt, Wallace A.	Rochester
Lott, Frederick H.	Minneapolis	† MacDonald, Daniel A.	Minneapolis	*† Mesker, George H.	Olivia
Louisell, Charles T.	Fairmont	MacDonald, John W.	Minneapolis	Messenheimer, Myron G.	Minneapolis
Love, Frederick A.	Carlos	MacDonald, Roger A.	Littlefork	Messer, James W.	Rochester
Love, J. Grafton	Rochester	MacKinnon, Donald C.	Minneapolis	Messick, Richard T.	Rochester
Lovett, Beatrice R.	Oak Terrace	MacLean, Alexander R.	Rochester	Metcalf, Norman B.	Princeton
Lowe, Earl R.	So. St. Paul	MacRae, Gordon C.	Duluth	Metz, Donald D.	Buffalo Lake
Lowe, Thomas A.	So. St. Paul	Mach, Frank B.	Minneapolis	† Metzgerott, Kirk O.	Rochester
Lowry, Elizabeth C.	Minneapolis	Mach, Ralph F.	Pine City	Meyer, Alvin J.	Minneapolis
Lowry, Paul T.	Minneapolis	Macheledt, Neil L.	Wadena	Meyer, Anthony A.	Melrose
Lowry, Thomas	Minneapolis	Macklin, William E., Jr.	Willmar	† Meyer, E. Lawrence	Minneapolis
† Luck, Hilda	Mankato	Mackoff, Sam M.	Unknown	Meyer, Frederick C.	Kenyon
Luckmeyer, Carl J.	St. Cloud	Madalin, Herbert E.	Rochester	Meyer, Paul F.	Faribault
Lueck, Wallace W.	Minneapolis	Madland, Robert S.	St. Paul	Meyer, Robert J.	Minneapolis
Lufkin, Nathaniel H.	Minneapolis	Maeder, Edward C.	Minneapolis	Meyer, Robert P.	Faribault
Lukk, Olaf	Montgomery	Magath, Thomas B.	Rochester	† Meyerding, Edward A.	St. Paul
Lund, Carl J. T.	Fergus Falls	Magney, Fredolph H.	Duluth	† Meyerding, Henry Wm.	Rochester
Lund, George W.	Minneapolis	Magnuson, Allen E.	Wheaton	Michael, Joseph C.	Minneapolis
Lund, Werner J.	Staples	Magnuson, Raymond C.	Cambridge	Michel, Henry H.	Minneapolis
† Lundberg, Ruth I.	Minneapolis	Magraw, Richard M.	Minneapolis	Michels, Roger P.	Willmar
† Lundblad, Robert M.	Minneapolis	† Maher, Frank T.	Rochester	Michelson, Henry E.	Minneapolis
Lundblad, Roy A.	Minneapolis	Mahle, Donald G.	Plainview	Michienzi, Leonard J.	St. Paul
Lundblad, Stanley W.	Minneapolis	Mahle, James P.	Minneapolis	† Mickelsen, Emma F.	Minneapolis
Lundberg, Karl R.	Minneapolis	* Mahowald, Aloys	Fergus Falls	Mickelson, John C.	Mankato
Lundell, Carl L.	Granite Falls	Maitland, Edwin T.	Jackson	Midboe, Gilbert T.	St. Paul
Lundholm, Arthur M.	St. Paul	† Maki, Stephen W.	Rochester	Midtune, Andreen S.	Lake Park
Lundquist, Curt W.	Owatonna	† Maki, Clarence O.	Minneapolis	Miettunen, John B.	Chisholm
Lundquist, Virgil I. P.	Minneapolis	Malerich, J. Anthony	St. Paul	Milhaupt, Emmett N.	St. Cloud
Lundsten, Leslie C.	Bemidji	Malerich, J. Anthony, Jr.	St. Paul	Miller, Albert G.	St. Paul
Lundy, John S.	Rochester	Malmstrom, John A.	Virginia	Miller, Arden L.	Minneapolis
Lynch, Francis W.	St. Paul	Mandel, Sheldon L.	Minneapolis	Miller, Harold E.	Minneapolis
† Lynch, Matthew J.	Minneapolis	Manger, William M.	Rochester	Miller, Herman	Austin
Lyon, John D., Jr.	Hopkins	Mankey, James C.	Minneapolis	Miller, Hugo E.	Minneapolis
Lyons, James H.	Minneapolis	Mankin, Harold T.	Rochester	Miller, John C.	Minneapolis
Lyons, William S.	Douglas	Manlove, Charles H., Jr.	St. Paul	Miller, Roland D.	Rochester
† Lysne, Henry	Minneapolis	Mann, George A.	Minneapolis	Miller, Ross H.	Rochester
Lysne, Myron	Robbinsdale	† Manson, Frank M.	Worthington	† Miller, Victor I.	Mankato
† Lysyj, Anatol	Minneapolis	March, Kenneth A.	Cambridge	Miller, William P.	Montevideo
Lyzena, Anton G.	Minneapolis	Margulis, Alexander R.	Minneapolis	Miller, William T.	Minneapolis

ALPHABETIC ROSTER

MAY, 1957

ALPHABETIC ROSTER

† Paulson, Theodore S. Fergus Falls
Paulson, Wallace J. Minneapolis
Pawlias, Kenneth T. Rochester
Payne, Richard E. Virginia
† Payne, William S. Rochester
Pearce, Francis M., Jr. Rochester
† Pearsall, R. P. Virginia
Pearson, Bror F. Shakopee
Pearson, Fritz R. St. Paul
Pearson, Malcolm M. St. Paul
Pease, Gertrude L. Rochester
Peck, Owen C. Rochester
Peck, Willard R. St. Paul
Pedersen, Arthur H. St. Paul
Pedersen, Robert L. Brainerd
Pedersen, Roy C. Duluth
Peluso, Charles R. Minneapolis
† Pemberton, John D. Rochester
*† Penhall, Fletcher W. Morton
† Penk, Engward L. Springfield
Penn, George E. Mankato
† Pennie, Daniel F. V. Duluth
Peppard, Thomas A. Minneapolis
Perkins, Douglass E. Alexandria
Perlman, Everett C. Minneapolis
Perlman, Herschel L. Minneapolis
Perry, Harold Rochester
Person, John P. Albert Lea
Pertl, Albert L. Canby
Peteler, Jennings C. L. Minneapolis
Peterman, Albert F. Rochester
Peters, Gustavus A. Rochester
Petersen, Deane A. Minneapolis
Petersen, Donald H. Northfield
Petersen, Glenn L. Minneapolis
Petersen, Magnus C. Rochester
Petersen, Peter C. Minneapolis
Petersen, Robert T. St. Cloud
Petersen, Robert W. Rochester
Petersen, William E. Minneapolis
Petersen, Alice H. Minneapolis
Petersen, Alvin C. Mora
Petersen, David B. St. Paul
Petersen, Donald H. St. Paul
Petersen, Edward A. St. Paul
Petersen, Edward N. Virginia
Petersen, Harold O. St. Paul
Petersen, Henry W. Minneapolis
Petersen, Herbert W. Minneapolis
Petersen, Joel L. E. St. Paul
Petersen, John H. Duluth
Petersen, Kenneth A. Marshall
† Petersen, Kenneth H. Hutchinson
Petersen, Lowell F. A. Rochester
Petersen, Nordahl P. Minneapolis
† Petersen, Oliver H. Minneapolis
Petersen, Oliver H., Jr. Minneapolis
Petersen, Palmer A. Minneapolis
† Petersen, Peter E. Minneapolis
Petersen, Roy A. Vesta
Petersen, Roy L. White Bear Lake
Petersen, Stanley C. Austin
Petersen, W. H. Austin
Petersen, Willard C. Minneapolis
Petersen, Willard E. Willmar
Petit, Julien V. Minneapolis
† Petit, Leon J. Minneapolis
Petraborg, Harvey T. Atkin
Petersen, George R. St. Paul
† Petiet, John R. Unknown
Pewters, John T. Minneapolis
Peyton, William T. Minneapolis
Phalen, Patrick T. Rochester
Phares, Otto C. St. Cloud
Phelan, John T. Rochester
† Phelps, Kenneth A. Menlo Park, Calif.
Phifer, Robert L. Rochester
Phillips, Donald F. Rochester
Philp, David R. Watertown
Pierce, Charles H. Wadena
Pierce, Jack R. Pikeville, Kentucky
Pierce, Robert B. Renville
Pierson, Roy F. Slayton
Pilgrim, Robert D. Benson
† Piper, Monte C. LaCanada, Calif.
† Piper, William A. Mountain Lake
Plasha, Matthew K. Anoka
Plass, Herbert F. R. Minneapolis
† Platou, Erling S. Minneapolis
Pleissner, Karl W. Minneapolis
Plimpton, Nathan C., Jr. Minneapolis
*† Plondke, Fred J. White Bear Lake
Plotke, Harry L. St. Paul
Plott, Carol L. Heron Lake
Plucker, Milton W. Worthington
Plum, George E. Rochester
Pogue, Richard E. Carson City, Nevada
Pohl, John F. M. Minneapolis
† Poirier, Joseph A. Forest Lake
Pollak, Kurt. Minneapolis
Pollard, William S. Rochester
Polley, Howard F. Rochester
Pollock, Anthony J. Minneapolis
† Pollock, David K. Minneapolis

Polski, Paul G. So. St. Paul
Polzak, Jacob A. Minneapolis
Pone, John Cambridge
Ponterio, James E. Shakopee
Pool, Thomas L. Rochester
† Poppe, Frederick H. Minneapolis
† Porter, Oliver N. Atwater
† Pratt, Edmund A. St. Paul
Potter, Robert B. Minneapolis
Power, John E. Duluth
Power, John E., Jr. Duluth
† Pratt, Fred J. Minneapolis
Pratt, Fred J., Jr. Minneapolis
Pratt, George F. Rhinelander, Wisc.
Pratt, Joseph H., Jr. Rochester
† Preine, Irving A. Osseo
† Preisinger, Joseph W. Dallas, Texas
Prem, Konald A. Minneapolis
Preston, Paul J. Minneapolis
Price, William E. Minneapolis
Prickman, Louis E. Rochester
Priest, Robert E. Minneapolis
Priestley, James T. Rochester
† Prim, Joseph A. Minneapolis
Prins, Leo R. Albert Lea
Proeschel, Ray K. Willmar
Proffitt, William E. Minneapolis
Proshke, Charles E. Minneapolis
Proud, Harry S. St. Paul
Pruitt, Raymond D. Rochester
Pugh, David G. Rochester
Pumala, Erven E. Warren
Purnell, Don C. Rochester
Purves, G. Harland. Buffalo
Puumala, Reino H. Cloquet

Quanstrom, Virgil E. Brainerd
Quattlebaum, Frank W. St. Paul
Quello, Robert O. B. Minneapolis
Quiggle, Arthur B. Minneapolis
Quist, Henry W., Jr. Minneapolis

*† Raadquist, Charles S. Hibbing
Raattama, John W. Nashwauk
Racer, Harley J. Minneapolis
Raetz, Sylvester J. Maple Lake
† Ragen, Patrick A. Rochester
Raile, Richard B. Minneapolis
Rajala, Arnold I. Grand Rapids
Ralph, James R. St. Paul
Ralston, Donald E. Rochester
Ramlow, Ralph M. St. Paul
† Ramsey, Walter R. St. Paul
Randall, Lawrence M. Rochester
Randall, Raymond V. Rochester
Ransom, H. Robert. Osseo
† Ransom, Matthias L. Hancock
Rasmussen, Ramby C. St. Paul
Ratelle, Alexander E. Minneapolis
Ravits, Harold G. St. Paul
Rayner, Ralph R. Glencoe
Rea, Charles E. St. Paul
† Reader, Donald R. Minneapolis
† Redding, Foster K. Minneapolis
Reed, Paul. Virginia
Reed, Sheldon C. Minneapolis
† Reeves, Melvin M. St. Paul
Reef, Alan R. Crookston
Regnier, Edward A. Minneapolis
Reichelderfer, Charles F. Staples
Reid, James W. So. St. Paul
Reif, Harold A. Minneapolis
Reif, Henry J. St. Cloud
Reif, Robert W. White Bear Lake
† Reifsnnyder, William Henry III. Rochester
Reiley, Richard E. Minneapolis
† Reineke, George F. New Uni
Reinhardt, James H. Alexandria
Reiser, Milton P. Minneapolis
Reitmeier, Richard J. Rochester
ReMine, William H., Jr. Rochester
Remele, William D. Minneapolis
Remsburg, Robert R. Tracy
† Replogle, William H. Los Angeles, Calif.
Resch, Joseph A. Minneapolis
† Restall, Charles J. Rochester
Reynolds, Donald P. Minneapolis
† Rhodes, Donald V. Rochester
Rice, Carl O. Minneapolis
Rice, Frank B. Minneapolis
Rice, Fred A. Minneapolis
Rice, Hagbart G. Moorhead
Richards, Albert M. St. Paul
Richards, Ernest T. F. St. Paul
Richards, William B. St. Cloud
Richardson, Edward J., Jr. St. Paul

Richardson, Robert J. St. Paul
Richdorf, Lawrence F. Minneapolis
Richter, David J. Virginia
Rick, Paul F. W. St. Paul
Rieke, Wellington W. Wayzata
Rieschl, Elizabeth K. Jordan
Rigler, Leo G. Minneapolis
Rimas, Matthew J. Comfrey
Ringle, Otto F. Walker
Kinkey, Eugene St. Paul
Riordan, Elsie M. Minneapolis
Risch, Ronald E. Minneapolis
Risser, Alden F. Stewartville
Ritchie, Wallace P. St. Paul
Ritt, Albert E. St. Paul
† Ritzinger, Frederick R. Gowrie, Iowa
Rizer, Dean K. Minneapolis
† Rizer, Robert L. Wayzata
Roach, Donald E. St. Paul
Robb, Edwin F. Minneapolis
† Robbins, Charles P. Winona
Robbins, Owen F. Minneapolis
Roberts, Byron H. Minneapolis
† Roberts, Frank E. Unknown
Roberts, Lewis J. Minneapolis
Roberts, Oliver W. Owatonna
Roberts, Stanley W. Minneapolis
† Roberts, William B. Minneapolis
Robertson, Paul A. Austin
Robilliard, Charles M. Faribault
Robinett, Robert W. Worthington
Robinson, Cortland O. Minneapolis
Robinson, David B. Rochester
Robinson, Hugh P. Rochester
Rock, William H. Anoka
Rocknem, Robert E. Minneapolis
Rockwell, Curtis V. Minneapolis
Rockwood, Philo H. Fergus Falls
† Rodda, Frederick C. Minneapolis
Rodenbaugh, Fredrich H. Rochester
Rodgers, Richard S. Minneapolis
Roehlke, Arthur B. Elk River
Roemer, Henry J. Winona
Rogers, Charles W. Winona
Rogers, Sydney F. St. Paul
Rogin, Norton. Minneapolis
Rogne, William G. Spring Grove
Roholt, Christian L. McIntosh
Rohrer, Christian A. Worthington
Rohlg, David H. St. Paul
Rollie, Orris O. St. Paul
Rollins, Pat. Wayzata
† Rollins, Troy G. Rochester
Rome, Howard P. Rochester
Romness, Kenneth B. Mound
Rooke, Edward D. Rochester
Rorem, Joseph A. Appleton
Rose, John T. Lakefield
Rosenbaum, David L. Minneapolis
Rosendahl, Frederick G. Minneapolis
Rosenfield, Abraham B. Minneapolis
Rosenow, John H. Minneapolis
Rosenthal, F. Harold. Austin
Rosenthal, Robert. St. Paul
† Rosenwald, Reuben M. Coon Rapids
Ross, Alexander J. Minneapolis
Rossberg, Raymond A. Morris
Rossen, Ralph X. Minneapolis
Rossing, Robert G. Minneapolis
Rotenberg, Robert J. Minneapolis
Roth, Frederick D. Mankato
Roth, George C. St. Paul
† Roth, Harry L. Oakland, Calif.
Rothnem, Morris S. Minneapolis
† Rothschild, Harold J. St. Paul
Rottenberg, Everett N. Rochester
Roust, Henry A. Montevideo
Rovelstad, Randolph A. Rochester
† Rovelstad, Roger A. White Plains, N. Y.
Rowe, Clarence J., Jr. St. Paul
Rowe, Olin W. Duluth
Rowles, Everett K. Coleraine
Roy, Phil C. St. Paul
Ruchie, Warren H. Willmar
Rucker, Charles W. Rochester
Rucker, William H. Minneapolis
Rud, Norman E. Minneapolis
† Rudell, Gustave L. Minneapolis
Rudie, Clifford N. St. Peter
Rudie, Peter S. Duluth
Rudie, William D. Duluth
Ruggles, George M. Forest Lake
† Rubberg, George M. Santa Barbara, Calif.
Rumpf, Carl W. Faribault
Runquist, John M. Duluth
Runquist, Richard K. Good Thunder
Rushton, Joseph G. Rochester
Russ, Homer H. Blue Earth
Russeth, Arthur N. Minneapolis
Rusten, Elmer M. Minneapolis
Rusterholz, Alan P. St. Paul
Rutledge, John B. Detroit Lakes
Rutledge, Lloyd H. Detroit Lakes

ALPHABETIC ROSTER

Ryan, John J. St. Paul
 Ryan, Joseph M. St. Paul
 Ryan, William J. Duluth
 Rydberg, Wayne C. Minneapolis
 Ryding, Vincent Mountain Lake
 Rydland, Arne D. Golden Valley
 Rygh, Harold N. Atwater
 Rynda, Edwin R. New Prague
 Ryeanson, Edward H. Rochester
 Rysgaard, George M. Northfield

St. Cyr, Harry M., Jr. Robbinsdale
 St. Cyr, Kenneth J. Robbinsdale
 Sabin, Frederick C. Rochester
 Sach-Rowitz, Alvan Moose Lake
 Sadler, William P. Minneapolis
 Saffert, Cornelius A. New Ulm
 Safirescu, Sorin R. Minneapolis
 Sahr, Walter G. Hutchinson
 Salassa, Robert M. Rochester
 Saliterman, Bernard I. Minneapolis
 Salk, Richard J. Albany
 Salter, Reginald A. Virginia
 Samuelson, Samuel Minneapolis
 Sanchez, James J. Rochester
 Sandeen, Robert M. Buffalo
 Sanderson, Anton G. Ashby
 Sanderson, David J. Fergus Falls
 Sandt, Karl E. Minneapolis
 Sandven, Nels O. Paynesville
 Sanford, Arthur H. Rochester
 Sanford, John B. Chicago, Illinois
 Sanford, Raymond A. Mankato
 Sarff, Oliver E. Duluth
 Sargent, Edward C., Jr. Austin
 Sarnecki, M. M. St. Paul
 Satersmoen, Theodore Pelican Rapids
 Sather, Edgar L. Fosston
 Sather, Edgar R. Alexandria
 Sather, George A. Fosston
 Sather, Richard N. Fosston
 Sather, Russell O. Crookston
 Satterlee, Howard W. Lewiston
 Satterlund, Victor L. New Richmond, Wisc.

Sauer, William G. Rochester
 Savage, Francis J. St. Paul
 Sawaryniuk, Iwan Waconia
 Sawatzky, William A. Minneapolis
 Sawtell, Robert R. Worthington
 Sax, Milton H. Duluth
 Sax, Simon G. Duluth
 Saxman, Gertrude O. Georgetown
 Sayre, George P. Rochester
 Sborov, Abe M. Minneapolis
 Scanlon, Paul W. Rochester
 Schaaf, Frederick H. K. Minneapolis
 Schaar, Francis E. Minneapolis
 Schade, Frederick L. Worthington
 Schaefer, Joseph C. Rochester
 Schaefer, Joseph F. Owatonna
 Schaefer, Kenneth F. Minneapolis
 Schaefer, Wesley G. Minneapolis
 Schaffhausen, Mildred Minneapolis
 Schamber, Walter F. Parkers Prairie
 Schatz, Francis J. St. Cloud
 Scheidel, Alois M. Mankato
 Scheiffley, Charles H. Rochester
 Scheldrup, N. H. Miami, Fla.
 Scherer, Leslie Raymond Minneapolis
 Scherling, Sidney S. Minneapolis
 Schiele, Burrtrum C. Minneapolis
 Schimelpfenig, George T. Chaska
 Schirber, Martin J. Grand Rapids
 Schirger, Alexander Rochester
 Schissel, Gregory A. Minneapolis
 Schmid, John F. Duluth
 Schmidt, Herbert W. Rochester
 Schmidt, Hilmar R. Rushford
 Schmidt, Paul A. Aurora, Illinois
 Schmidt, Paul G. Granite Falls
 Schmidt, Ruben F. Alden
 Schmidt, W. Robert Minneapolis
 Schmidtke, Reinhardt L. St. Paul
 Schmitt, S. C. Los Angeles, Calif.
 Schmitz, Anthony A. Mankato
 Schmitz, Everett J. Waukegan, Illinois
 Schmitz, Glenn P. Little Falls
 Schneek, Jack I. Minneapolis
 Schneider, James A. Rochester
 Schneider, Lawrence E. Duluth
 Schneider, Paul J. Adams
 Schnell, Frederick S. Litchfield
 Schoch, Robert B. J. St. Paul
 Schoeneberger, P. B. Perham
 Scholpp, Otto W. Hutchinson
 Scholz, Donald A. Rochester
 Schons, Edward St. Paul
 Schossow, George W. Erskine
 Schottler, Max E. Minneapolis
 Schroder, Charles H. Pottstown, Pa.

Schroeder, Hugo F. St. Paul
 Schroeder, Albert J. Minneapolis
 Schroepfel, John E. Winthrop
 Schulberg, Verne A. Gaylord
 † Schulz, Frederick C. St. Paul
 Schultz, Alvin L. Minneapolis
 Schultz, Earl A. Minneapolis
 † Schultz, J. Albert Albert Lea
 Schultz, J. Harold Minneapolis
 Schultz, Peter J. Minneapolis
 Schultz, Robert B. Minneapolis
 Schulz, Robert W. Fairmont
 † Schulze, Albert G. St. Paul
 Schulze, William M. Minneapolis
 Schumacher, John W. Minneapolis
 Schumacher, Otto P. Rochester
 Schut, John W. Anoka
 Schutz, Elmer S. Mountain Lake
 Schwartz, E. Robert Minneapolis
 † Schwartz, John T. Rochester
 Schwartz, Virgil J. Minneapolis
 Schweiger, Theodore R. Hibbing
 Schwyzer, Arnold G. St. Paul
 Schwyzer, Hanns C. St. Paul
 Schwyzer, Marguerite St. Paul
 Sciarra, Paschal A. Rochester
 Scott, Eugene E. St. Paul
 Scott, Horace G. Minneapolis
 † Scott-Miller, James R. Rochester
 Scudamore, Harold H. Rochester
 Seaberg, John A. Minneapolis
 Seashore, Rosel T. Duluth
 † Seay, James Elbert, III. Rochester
 † Sebrechts, Paul. Great Lakes, Ill.
 Seery, Thomas M. Austin
 Seham, Max Minneapolis
 Seifert, Milton H. Excelsior
 Seifert, Otto J. New Ulm
 Sekanina, Jan Babbitt
 Sekhon, Mohan S. St. Paul
 Selby, John B. Rochester
 Selck, Wolfgang T. Minneapolis
 Seldon, Thomas H. Rochester
 Sells, Richard J. No. St. Paul
 Selmo, Joseph D. Norwood
 Semsch, Robert D. Minneapolis
 Senders, Wilbur L. Rochester
 † Senn, Edward W. Owatonna
 Sethre, Arthur E. Fergus Falls
 Setzer, Robert J. St. Paul
 Shandorf, James F. Minneapolis
 Shannon, William R. St. Paul
 Shaperman, Eva P. Minneapolis
 Shapiro, Irving Minneapolis
 Shapiro, Sidney K. Minneapolis
 Sharp, David V. Minneapolis
 Shaver, Ward. Fergus Falls
 Shaw, Howard A. Minneapolis
 Shea, Andrew W. Minneapolis
 Shea, Daniel W. Rochester
 Sheedy, Chester L. Austin
 Shelandar, Marcus I. St. Paul
 † Shellman, John L. Pacific Palisades, Calif.
 Sheppard, Charles G. Hutchinson
 Sher, David A. Virginia
 Sher, Lewis Minneapolis
 Sherman, Alfred G. Albert Lea
 Sherman, Carnot H. Bayport
 Sherman, Charles L. Luverne
 Sherman, Lloyd F. Minneapolis
 Sherman, Royal V. Red Wing
 † Sherwood, George E. Kimball
 Shick, Richard M. Rochester
 Shillington, Maurice A. Minneapolis
 † Shirai, Shohei. Fort Harrison, Indiana
 Short, Jacob St. Paul
 Shragg, Robert I. Minneapolis
 Shronts, John F. Minneapolis
 Sidell, Franklin D. Minneapolis
 Siegel, Clarence St. Paul
 Siegel, John S. Virginia
 Siegmann, William C. Minneapolis
 Siefert, Robert G. Rochester
 Silas, Ralph M. Minneapolis
 Silver, Arthur W. Rochester
 Silver, John D. Minneapolis
 Simmon, Carl Barnesville
 Simmonds, Harry N. Prior Lake
 † Simmons, William Henry Lexington, Kentucky
 Simons, Bernard H. Chaska
 Simons, Edwin J. Edina
 † Simons, Jalmar H. Minneapolis
 Simons, Leander T. St. Paul
 Simonson, Donald B. Minneapolis
 Simonson, Kinsey M. Rochester
 † Simpson, Ellery DeW. Phoenix, Ariz.
 Sinamark, Andrew Hibbing
 Singer, Benjamin J. St. Paul
 Sinykin, Melvin B. Minneapolis
 Siperstein, David M. Minneapolis
 Sisk, Harvey E. St. Cloud

Sisler, Clifford E. Grand Rapids
 † Sivertsen, Andrew Minneapolis
 † Sjoding, J. Donald Mankato
 Sjostrom, Lawrence E. St. Peter
 Skaife, William F. Little Falls
 Skaug, Harold M. Chatfield
 Skinner, Abbott St. Paul
 † Skinner, Harvey O. St. Paul
 Skjold, Arthur C. Minneapolis
 Skogerboe, Rudolph B. Karlstad
 † Skworcow, George St. Paul
 Slater, Sidney A. Worthington
 Slocumb, Charles H. Rochester
 Smiley, John T. Minneapolis
 Smisek, Elmer A. St. Paul
 Smisek, Frank M. Minneapolis
 Smith, Adam M. Minneapolis
 Smith, Archie M. Minneapolis
 Smith, Baxter A., Jr. Minneapolis
 Smith, Cyril M. Duluth
 Smith, Don V. Blue Earth
 † Smith, Frederick L. Rochester
 Smith, George R. Hutchinson
 Smith, Graham G. Minneapolis
 Smith, Harry J. Lake Crystal
 † Smith, Harry L. Rochester
 † Smith, Homer R. Minneapolis
 Smith, Lloyd A. Willmar
 Smith, Lucian A. Rochester
 † Smith, Margaret I. Gardena, Calif.
 Smith, Meredith P. Rochester
 † Smith, Myron W. Red Wing
 Smith, Nadine G. Minneapolis
 Smith, Norvin R. Willmar
 Smith, Paul M. Lake Crystal
 Smith, Ralph E. Minneapolis
 Smith, Reginald A. Rochester
 Smith, Theodore S. Minneapolis
 Smith, Thorsten Faribault
 Smith, Vernon D. E. St. Paul
 Smith, Wallace R. Grand Marais
 Smith, William G. Rochester
 Smith, William T. Minneapolis
 Smorstok, Matthew B. Monticello
 Smyth, John J. Lester Prairie
 Snider, Howard R. Mankato
 Snyder, Clifford D. Kiester
 Snyder, George W. St. Paul
 Snyder, Omer E. Ely
 Soderlind, Regnar T. Minneapolis
 † Sogge, Ludwig L. Windom
 Sohlberg, Olof I. St. Paul
 † † Sohmer, Alphonse E. Mankato
 Solhaug, Samuel B. Minneapolis
 Solhaug, Samuel B., Jr. Minneapolis
 † Solsem, Frederick N. S. Spicer
 Solvason, Harold M. Minneapolis
 Sommerdorf, Vernon L. St. Paul
 Sommers, M. Duane Fergus Falls
 Sommers, Ben St. Paul
 Sommersville, Robert L. Rochester
 Sonnesyn, Nels N. Le Sueur
 Sontag, David W. Lake City
 Sorem, Milton B. St. Paul
 Sorum, Frithjof T. Willmar
 Soucheray, Philip H. St. Paul
 Soule, Edward H. Rochester
 Souster, Benjamin B. St. Paul
 Sowada, Ernest J. St. Paul
 Spain, W. Thomas Princeton, N. J.
 Spang, Anthony J. Duluth
 Spang, James S. Duluth
 Spang, William M. Duluth
 Spano, Joseph P. Minneapolis
 Spencer, Bernard J. Minneapolis
 Spieler, Forrest B. Pequot Lakes
 Spink, Wesley W. Minneapolis
 Spittel, John A., Jr. Rochester
 Sponsel, Kenath H. Minneapolis
 Sprafka, Gregory A. St. Paul
 Sprafka, Joseph L. St. Paul
 Sprafka, Joseph M. St. Paul
 Sprague, Randall G. Rochester
 † Spratt, Charles N. Minneapolis
 † Spudis, Edward V. Rochester
 Spurzem, Raymond J. Anoka
 Stadem, Clifford J. Twin Valley
 Stahl, George W. Austin
 Stahler, Paul A. Jordan
 † Stahn, Louis H. Modesto, Calif.
 Stahr, Aubrey C. Hopkins
 Stam, John Worthington
 Stanford, Charles E. Minneapolis
 † Stangl, Philip E. St. Cloud
 Stanley, Charles O. Rochester
 † Stanley, Court R. Minneapolis
 Starekow, Milton D. Thief River Falls
 Starr, Grier F. Rochester
 † Starr, Jason L. Rochester
 Staub, Henry P. Minneapolis
 Stauffer, Maurice H. Rochester
 Steffens, Leon A. Red Wing
 Stein, Harold A. Rochester

ALPHABETIC ROSTER

Stein, Raymond J. Pierz
 Stein, William A. Ely
 Steinberg, Charles L. St. Paul
 Steiner, Leon E. Albert Lea
 Steinhilber, Richard M. Rochester
 Stelter, Lloyd A. Minneapolis
 Stemsrud, Harold L. Alexandria
 Stenness, John L. Minneapolis
 Stensgaard, Kermit L. Thief River Falls
 † Stenstrom, Annette Minneapolis
 Stephens, William E. Minneapolis
 Sterner, Donald C. St. Paul
 Sterner, E. R. St. Paul
 Sterner, John J. St. Paul
 Sterrie, Norman A. Minneapolis
 Stevens, Robert G. Rochester
 Stevenson, Basil M. Fulda
 * Stevenson, Frank W. Fairbault
 Stewart, Alexander St. Paul
 Stewart, Donald E. Crookston
 Stewart, Marvin J. Minneapolis
 Stewart, Rolla I. Minneapolis
 Stickney, J. Minott. Rochester
 Stiegler, Farrell S. Minneapolis
 Stillwell, George K. Rochester
 Stillwell, Walter C. Mankato
 Stillwell, George G. Rochester
 Stoesser, Albert V. Minneapolis
 Stolpestad, Armer H. St. Paul
 Stolpestad, Herbert L. St. Paul
 Stoltz, Robert C. Minneapolis
 † Stoltze, Cynthia A. Rochester
 † Stomel, Joseph Los Angeles, Calif.
 † Stone, Norman F. Minneapolis
 † Stone, Stanley P. Minneapolis
 † Stool, Newsom Rochester
 † Stormont, James R. Rochester
 Storsteen, Kenneth A. Duluth
 Stoy, Robert A. Little Falls
 † Strachauer, Arthur C. Minneapolis
 † Strand, Jack W. St. Paul
 Stransky, Theodore W. Owatonna
 Strate, Gordon E. St. Paul
 Strathern, Carleton S. St. Peter
 † Strathern, Fred P. St. Peter
 † Strathern, Moses L. Gilbert
 Stratte, Alf K. Pine City
 Stratte, Harold C. Windom
 Strauchler, Jonas Belview
 Straus, M. L. St. Paul
 Street, Bernard Northfield
 Streitz, John M. Duluth
 Strem, Edward L. St. Paul
 Strewler, Gordon J. Duluth
 Strickler, Jacob H. Minneapolis
 * Strobel, William G. Duluth
 Stroebel, Charles F., Jr. Rochester
 Strom, Gordon W. Minneapolis
 Stromgren, Delph T. Minneapolis
 Stromme, William B. Minneapolis
 Strunk, Clarence A. Minneapolis
 † Struxness, David Corona, Calif.
 Studer, Donald J. Fairbault
 Stuhr, John W. Stillwater
 Sturges, Robert L. Minneapolis
 Sturley, Rodney F. St. Paul
 Sturtz, George S. Rochester
 † Subby, Walter Minneapolis
 Sukov, Marvin Minneapolis
 Sullivan, Charles R. Rochester
 Sullivan, Raymond M. Minneapolis
 Sutherland, Harry N. Ely
 Sutherland, W. H. Spicer
 Sutton, Harris R. Hoffman
 Svien, Hendrik J. Rochester
 Swain, Francis M. Minneapolis
 † Swanson, John A. St. Paul
 Swanson, Lawrence J. St. Paul
 Swanson, Roy E. Minneapolis
 Swedberg, William A. Duluth
 Swedenberg, Paul A. Glenwood
 Sweetser, Horatio B. Minneapolis
 Sweetser, Theodore H. Minneapolis
 Sweetser, Theodore H., Jr. Minneapolis
 † Sweitzer, Samuel E. Minneapolis
 † Swendesen, Carl G. Minneapolis
 Swendesen, Carl J. Graceville
 Swenson, James J. St. Paul
 Swenson, Arnold O. Duluth
 Swenson, Donald B. Mankato
 Swenson, Donald B. St. Paul
 Swenson, Orvie J. Waseca
 Swenson, Richard W. Hibbing
 Swenson, Roy G. North Branch
 Symmonds, Richard E. Rochester
 Syverson, Jerome T. Rochester

Tanquist, Edwin J. Alexandria
 Taylor, Joseph H. Minneapolis
 Taylor, William E. Minneapolis
 Teeter, Richard R. Minneapolis
 Teich, Kenneth W. Duluth
 Teisberg, John E. St. Paul
 Tenner, Robert J. Minneapolis
 Terrell, Bernard J. Nopemung
 Tesch, Gordon H. Elk River
 Testor, James V. Minneapolis
 Tetlie, James P. Duluth
 Textor, Jerome Anoka
 Thayer, Ellsworth A. Fairmont
 Thayer, Richard A. Rochester
 Thielen, Robert D. St. Michael
 Thiem, Chester E. Mankato
 Thill, Leonard J. Balaton
 † Thomas, George E. Minneapolis
 Thomas, John V. Duluth
 Thomas, William H. Howard Lake
 Thomes, A. Boyd Minneapolis
 Thompson, Arthur Minneapolis
 Thompson, Carl O. Hendricks
 Thompson, Floyd A. St. Paul
 Thompson, Gershom J. Rochester
 Thompson, Russell A. Cosmos
 Thompson, Willis H. Minneapolis
 Thomson, James M. Austin
 Thoreson, M. C. Bernice So. St. Paul
 Thorsen, David S. Minneapolis
 Thorson, Stuart V. Minneapolis
 Thoun, Laurence G. Hibbing
 Thuringer, Carl B. St. Cloud
 Thysell, Desmond M. Minneapolis
 † Thysell, Fred A. Moorhead
 Thysell, Harold R. Crookston
 Thysell, Vernon D. Hawley
 Tift, Cyril R. St. Paul
 Tillisch, Jan H. Rochester
 * † Tingdale, August C. Minneapolis
 Tinkham, Robert G. Minneapolis
 Titrud, Leonard A. Minneapolis
 Tobin, John D. Minneapolis
 Tomhave, Wesley G. Hibbing
 Tongen, Lyle A. St. Paul
 Toon, Robert W. Minneapolis
 Torghelle, John R. Hastings
 Tosseland, Noel E. Duluth
 Trach, Benedict B. Minneapolis
 * Tracht, Robert R. St. Paul
 Traeger, Carl A. Fairbault
 Travis, James S. St. Paul
 Traxler, J. Felix Henderson
 Tregilgas, Harold R. So. St. Paul
 Tregilgas, Richard B. St. Paul
 Troost, Henry B. Mankato
 Trow, James E. Minneapolis
 Trow, William H. Minneapolis
 Trueman, Harold S. Minneapolis
 Truesdale, Clark W. Glencoe
 Tsai, Shih Hao. Oak Terrace
 Tucker, Richard C. Minneapolis
 Tudor, Richard B. Minneapolis
 † Tuohy, Edward L. Santa Barbara, Calif.
 † Turnaciff, Dale D. St. Paul
 Turner, John C., Jr. Rochester
 Tuura, James L. Duluth
 Tweedy, John A. Winona
 Tweedy, Robert B. Winona
 Twidwell, Joseph E. Minneapolis
 Twiggs, Leo F. Austin
 Twomey, John E. Minneapolis

Ubel, Frank A. St. Paul
 Uhley, Charles G. Crookston
 Uiblein, Alfred Rochester
 † Ulrich, Henry L. Minneapolis
 Ulvestad, Harold S. Minneapolis
 Underdahl, Laurentius O. Rochester
 Undine, Clyde A. Minneapolis
 Updike, Edwin H., II. Unknown
 Urberg, Sofus E. Duluth
 Utendorfer, Robert W. Minneapolis
 Utz, David C. Rochester

Vaaler, Robert Cokato
 † Vadheim, Alfred L. Tyler
 Valenti, Dan A. St. Cloud
 † Valentine, Walter H. Tracy
 Van Bergen, Frederick H. Minneapolis
 † Vance, John W. Rochester
 Van Cleve, Horatio P. Austin
 Vandersluis, Charles W. Bemidji
 Van Herik, Martin Rochester
 Van Meier, Henry Stillwater
 Van Rooy, George T. Thief River Falls
 Van Ryzin, Donald J. Duluth
 Varco, Richard L. St. Paul

Vaughan, Victor M. Truman
 Vaughn, Louis D. Rochester
 Veirs, Dean M. St. Paul
 Veirs, Ruby J. S. St. Paul
 Venables, Alexander E. St. Paul
 Veranath, Leonard A. St. Cloud
 Verby, John E., Jr. Rochester
 Vermund, Halvor Minneapolis
 Vezina, John C. Mapleton
 Vik, A. Elliott Minneapolis
 Vik, Melvin Cambridge
 † Viren, Fred K. Rochester
 Virnig, Hildegard J. Caledonia
 Virnig, Mark P. Wells
 Virnig, Richard P. Wells
 Vitols, T. M. Minneapolis
 Vix, Vernon A. Worthington
 Vogel, Howard A. L. New Ulm
 Vollmer, Frederick J. Winona
 Von Drasek, Joseph Mankato

Waas, Charles W. St. Paul
 Wadsworth, George L. Cambridge
 † Wagener, Henry P. Rochester
 Wagner, Norman W. Benson
 Wagoner, James M. Harmony
 Wahlquist, Harold F. Minneapolis
 Wakai, Coolidge S. Rochester
 Wakefield, Elmer G. Rochester
 † Wakim, Khalil G. Rochester
 Walder, Harold J. Duluth
 Waldmann, Edward B. Rochester
 Waldron, Carl W. Hopkins
 † Walfred, Karl A. St. Cloud
 † Walker, A. E. St. Paul
 Walker, Arthur E. St. Paul
 Wall, Carl R. Minneapolis
 Wall, James O. St. Paul
 Wallace, Helen M. Minneapolis
 Wallace, Martin O. Duluth
 † Waller, Joseph D. Pine City
 Wallinga, Jack St. Paul
 Walonick, Albert L. St. Louis Park
 Walsh, Edward F. St. Paul
 Walsh, Francis M. Minneapolis
 Walsh, William T. Minneapolis
 Walter, Clarence W. St. Paul
 Walter, Frederick H. International Falls
 Walter, William E. Wanamingo
 Walters, Waltman Rochester
 Wandke, Otto E. Fairmont
 Wangenstein, Owen H. Minneapolis
 Ward, Louis E. Rochester
 Ward, Percy A. Minneapolis
 Warner, James J. Perham
 Warren, Cecil A. St. Paul
 Wasmund, Clarence W. Red Wing
 Wasson, Loren F. Alexandria
 Waters, Alvin W. Minneapolis
 Watkins, Charles H. Rochester
 Watkins, John A. Wells
 Watson, Alexander M. Royalton
 Watson, C. Gordon Minneapolis
 Watson, Cecil J. Minneapolis
 Watson, Eleanor J. Unknown
 Watson, John R. Rochester
 Watson, P. Theodore St. Paul
 † Watson, Percy T. Miami, Fla.
 Watson, Robert M. Morris
 Watson, Sidney W. Royalton
 Watson, Virgil A. Detroit Lakes
 Watson, William H. A. St. Paul
 Watson, William J. Newport
 Wattenberg, Lee W. Minneapolis
 Watz, Clarence E. St. Paul
 † Waugh, John M. Rochester
 † Weaver, Myron M. Schenectady, N. Y.
 Weaver, Paul H. Fairbault
 Webb, Edgar A. Minneapolis
 Webb, Roscoe C. Minneapolis
 Webber, Fred L. St. Paul
 Webber, Richard J. St. Louis Park
 Weber, Harry M. Rochester
 Weber, Lowell W. Minneapolis
 Wedes, Deno J. St. Paul
 Weed, Lyle A. Rochester
 Weeks, Richard E. Rochester
 † Weil, Max H. Rochester
 Weir, James F. Rochester
 Weis, Benjamin A. St. Paul
 Weisberg, Maurice St. Paul
 Weisberg, Raphael J. Minneapolis
 Weiss, Carl A. Hastings
 Welch, John S. Rochester
 Wellman, William E. Rochester
 Wellner, Theodore O. Rochester
 Wells, Arthur H. Duluth
 Wells, Walter B. Jackson
 Wendland, John P. Minneapolis
 Wendt, H. Paul Thief River Falls
 Wenner, Waldemar T. St. Cloud

ALPHABETIC ROSTER

Wente, Harold A.....Rochester
Wentworth, Albert J.....Mankato
Wenzel, Gilbert P.....St. Paul
Werner, George.....Minneapolis
Wesolowski, Stanley P.....Minneapolis
West, Catherine C.....Minneapolis
Westby, Magnus.....Madison
Westby, Norval M.....Madison
Westerman, Alvin E.....Montgomery
Westerman, Fred C.....Montgomery
Westley, Kent.....Minneapolis
Westover, D. E.....St. Paul
Westrup, John E.....Lanesboro
Wetherby, Macnider.....Minneapolis
Wetteland, Thomas F.....W. St. Paul
Wetzel, Earl V.....St. Paul
Wexler, Harold M.....Minneapolis
Weyhrauch, William R.....Rochester
Wheeler, Daniel W.....Duluth
Wheeler, Robert W.....Minneapolis
Whisnant, Jack Page.....Rochester
Whitacre, John C., II.....Minneapolis
Whitcomb, Fred F., Jr.....Rochester
White, Asher A.....Minneapolis
White, S. Marx.....Minneapolis
White, Willard D.....Minneapolis
Whitesell, Lloyd A.....Minneapolis
Whitson, Sidney A.....Albert Lea
Whittemore, Dexter D.....Bemidji
Widen, Wilford F.....Minneapolis
Wikoff, Howard M.....Crookston
Wilcox, Charles F., III.....Rochester
Wilcox, G. Charles.....Albert Lea
Wilder, Kenneth W.....Minneapolis
Wilder, Robert L.....Minneapolis
Wilder, Russell M.....Rochester
Wilder, Russell M., Jr.....Topeka, Kans.
Wilder, Walter L.....Minneapolis
Wilken, Paul A.....Minneapolis
Wilkowske, Rudolph J.....Owatonna
Will, Charles B.....International Falls
Will, W. W.....Bertha
Willcutt, Clarence E.....Phoenix, Ariz.
Williams, Arthur B.....St. Paul
Williams, Bruce F. P.....Duluth
Williams, Charles A.....Pipestone
Williams, Clayton K.....St. Paul
Williams, Francis R.....Litchfield
Williams, George E.....St. Paul
Williams, Henry L., Jr.....Rochester
Williams, Hugh O.....Lake Crystal

Williams, John A.....St. Paul
† Williams, Leon A.....Minneapolis
Williams, Mervyn M.....Ah-gwah-ching
Williams, Marland R.....Cannon Falls
Williams, Paul A.....Minneapolis
Williams, Richard A.....St. Paul Park
Williams, Richard E.....Robbinsdale
† Williams, Robert.....Unknown
Williamson, Harold A.....Fairmont
Wilmot, Cecil A.....Litchfield
Wilmot, Harold E.....Litchfield
† Wilson, Clyde E.....Blue Earth
Wilson, J. Allen.....St. Paul
Wilson, James V.....St. Paul
Wilson, Louis J.....Winona
Wilson, Robert B.....Rochester
‡ Wilson, Robert E.....Minneapolis
Wilson, Rolland H.....Winona
Wilson, Viktor O.....Rochester
Wilson, Warren E.....Northfield
Winchell, Paul.....Minneapolis
Winge, H. C.....Wheaton
Wingquist, Carl G.....Crosby
Winkelmann, Richard K.....Rochester
Winn, William E., Jr.....New Orleans, La.
† Winnick, Joseph B.....St. Paul
† Winter, John A.....Duluth
Winter, Malcolm D., Jr.....Rochester
Winther, Nora M. C.....Minneapolis
Wiperman, Frederic F.....Minneapolis
Wisness, Osmund A.....Unknown
† Witham, Carl A.....Minneapolis
Witter, Robert L.....Wadena
Witthaus, Melvyn E.....St. Paul
† Wittich, Frederick W.....Minneapolis
Wittoesch, J. Hans.....Rochester
Wittrock, Louis H.....Watkins
Wohlraabe, Arthur A.....Minneapolis
Wohlraabe, A. Cabot.....Minneapolis
Wohlraabe, Clarence F.....North Mankato
Wohlraabe, Edwin J.....Springfield
Wohlraabe, John C.....St. Clair
Wolf, Alfred H.....Minneapolis
* Wolff, Herman J.....St. Paul
† Wolff, John M.....Duluth
Wolkoff, H. J.....St. Paul
Wollaeger, Eric E.....Rochester
Wolstan, Simon D.....Minneota
Wolter, Frederick H.....Minneapolis
† Woltman, Henry W.....Rochester
† Wood, Harry G.....Rochester

Wood, Lloyd T.....Forest Lake
† Woodington, George F.....Rochester
Woodruff, Whitney.....Virginia
† Woodward, Edward, Jr.....Rochester
Woolner, Lewis B.....Rochester
Word, Harlan L.....St. Paul
Workman, Warner G.....Tracy
Worrall, Janet.....Rochester
† Woyda, William C.....Minneapolis
Wright, J. Leo.....Rochester
Wright, Robert R.....Austin
Wright, Thomas D.....Minneapolis
Wright, Wale S.....Minneapolis
Wright, William S.....Minneapolis
Wuest, John H., Jr.....Rochester
Wyatt, Oswald S.....Minneapolis
Wynne, Herbert M. N.....Minneapolis

Yaeger, Wilbert W.....Marshall
Yarbro, Harold R.....Rochester
Ylvisaker, Ragnvald S.....Minneapolis
† Yoerg, Otto W.....Minneapolis
Young, Henry H.....Rochester
Young, Thomas O.....Duluth
Younger, Lewis I.....Winona
Youngren, Everett R.....St. Paul
Yue, Wen Y.....Oak Terrace

Zachman, Albert H.....Melrose
Zachman, Leo L.....St. Paul
Zagaria, James F.....St. Paul
Zahrendt, O. Lewis.....Minneapolis
Zarling, V. Richard.....Minneapolis
Zaworski, Leo A.....Minneapolis
Zee, Urban H.....Mankato
‡ Zeller, Nicholas H.....New York, N. Y.
Zemke, Erhart E.....Fairmont
Zemmers, Roberts.....Duluth
Zierold, Allen R.....Starbuck
Zimmermann, Arthur A.....Minneapolis
Zimmermann, Bernard.....St. Paul
† Zimmermann, Harry B.....St. Paul
Zinn, Charles W.....Elk River
Zinter, Ferdinand A.....Minneapolis
Ziskin, Thomas.....Minneapolis

General Interest

Dr. John F. Briggs, St. Paul, spoke on "Spending the Charity Dollar" at the March workshop of the St. Paul Inter Club Council.

* * *

Dr. Louis A. Buie, Rochester, received a scroll from the National Foundation for Infantile Paralysis recently. The award was made for Dr. Buie's services in the fields of administration and medical affairs for the Foundation.

* * *

Dr. Philip S. Hensch, Rochester, was a member of the Symposium on Rheumatic Diseases held in Stockholm, Sweden, April 14-18. Before his trip abroad, Dr. Hensch delivered the annual Nu Sigma Nu medical fraternity lecture before the student body of the University of Pittsburgh medical school. He also attended recent meetings of the American College of Physicians in Boston.

* * *

Dr. Owen H. Wangenstein and Dr. B. J. Kennedy, Minneapolis, spoke at the section meeting of the American College of Surgeons in St. Paul last month.

* * *

Dr. L. L. Sogge, Windom, was honored by the Windom Good Samaritan Home recently. The home voted to change its name to the "Sogge Memorial Home" in recognition of the many contributions in time and energy made to the project and to the community by Dr. Sogge.

* * *

Dr. Malcolm A. McCannel, Minneapolis, returned recently from nine weeks of practice at the Holland Eye Clinic in Shikarpur, Pakistan. One of the high points of Dr. McCannel's trip was a plane-and-car visit to Tensing Norkay, who is one of the first two men to climb Mount Everest.

* * *

Dr. Kenneth Peterson reopened his medical and surgical practice in Hutchinson, Minn., April 2, after receiving his discharge from the U. S. Army. Dr. Peterson practiced in Hutchinson from 1945 to 1955.

* * *

Dr. Leo G. Rigler, head of the Department of Radiology at the University of Minnesota, has resigned effective June 30 to become consultant of Cedars of Lebanon Hospital in Los Angeles, California. He will also teach, part-time, at the University of California Medical School in Los Angeles.

Dr. Rigler was a member of the Grand Rounds panel on "Pre-Malignant and Malignant Lesions of the Breast and Colon" seen over closed-circuit television at the Leamington Hotel in Minneapolis March 27.

* * *

Dr. Lester L. Bissinger, previously associated with the Brainerd Clinic, opened an independent practice recently. His offices are located in the Parker Building in Brainerd.

Dr. George W. Heine has discontinued the practice of medicine in Little Falls and taken a residency at University Hospitals, Minneapolis.

* * *

Dr. Gordon R. Kamman, of St. Paul, gave the commemorative address at the Seventh Anniversary celebration of the Fergus Falls Mental Hygiene Clinic which was held at Fergus Falls on Tuesday, April 9, 1957. His subject was "The Mental Hygiene Clinic and the Community."

* * *

At the invitation of the surgeon of the Fifth Army in Chicago, Dr. John S. Lundy of the Section of Anesthesiology of the Mayo Clinic spent the month of March visiting midwest and southwest army camp installations. Before returning home he participated in the thirty-first annual congress of the International Anesthesia Research Society in Phoenix, Arizona.

* * *

Dr. John W. Vance, a fellow in internal medicine in the Mayo Foundation and commander of the Medical Flight of the 9709th Air Reserve Squadron of Rochester, has been promoted to the rank of captain in the Air Force Reserve.

* * *

The medical staff of Fairview Hospital, Minneapolis, has elected Dr. Ragnar Soderlind chief of staff to succeed Dr. L. J. Roberts. Dr. Harry B. Hall is chief of staff-elect, Dr. Ralph Silas is secretary, and Dr. Harry O'Phelan is treasurer.

* * *

Drs. Howard Burchell and Jesse Edwards of the Mayo Clinic participated in a conference at Marquette University, Milwaukee, Wisconsin, May 15 to 18 on the subject "Work and the Heart." This conference will consider all the available data on the employment of persons with heart disease, in the hope that further investigation into the effect of employment on damaged hearts will be more effectively directed.

* * *

Dr. K. J. Halverson, a native of Albert Lea and a graduate of the University of Minnesota Medical School, has joined the staff of the Aitkin Clinic. Since his graduation in 1955 he has been practicing in Paynesville.

* * *

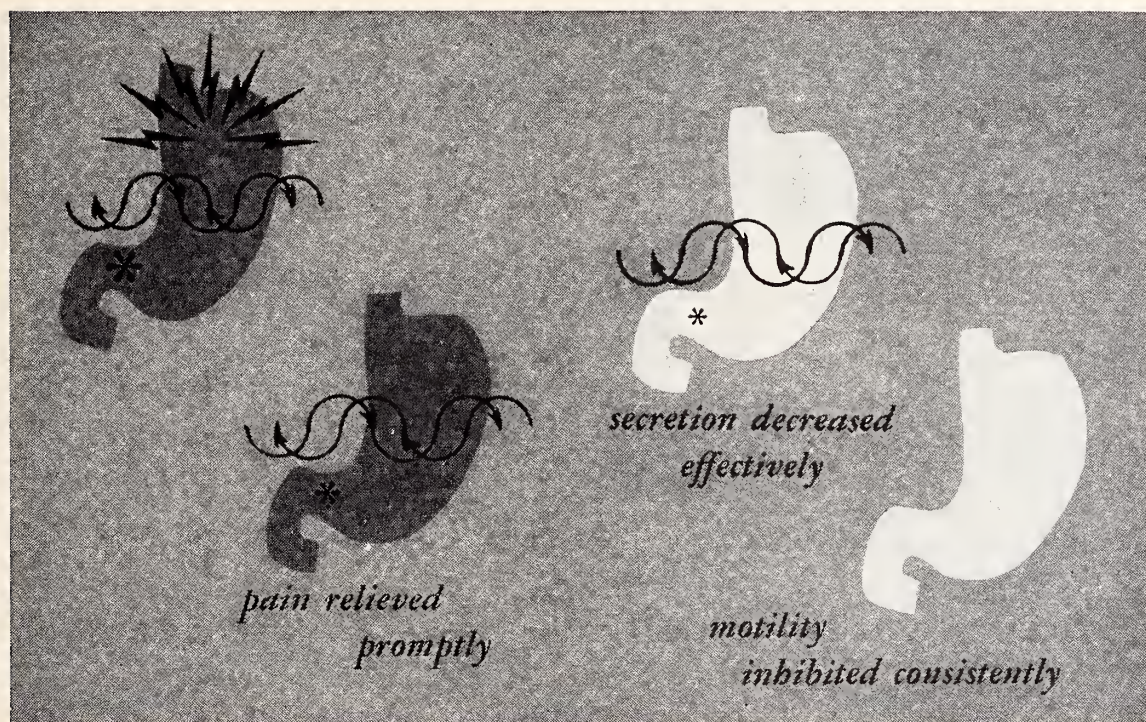
A research grant of \$173,117 has been made by the National Advisory Cancer Council to Dr. John J. Bittner, head of the University of Minnesota's department of cancer biology. The grant, which was made through the National Cancer Institute, a division of the U. S. Public Health Service, will enable Dr. Bittner to continue for the next five years his study of cancer in mice. Most of the new grant will be used for salaries for eight or ten assistant research workers, the rest for animal care.

(Continued on Page A-34)

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incidence of side effects was minimal. . . ."

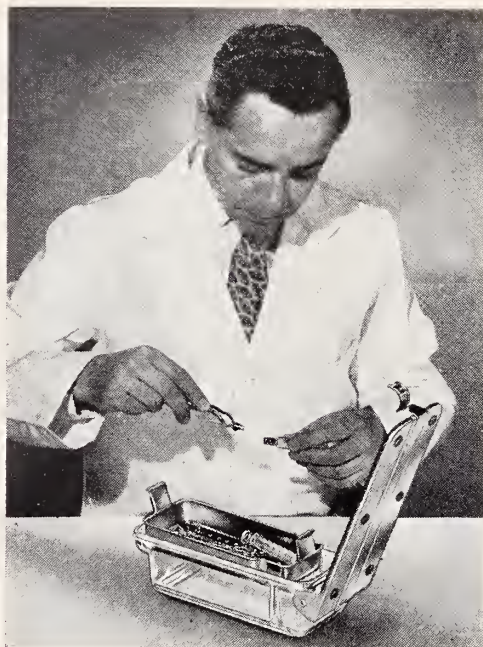
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*Lichstein, J.; Morehouse, M. G., and Osmon, K. L.: Pro-Banthine in the Treatment of Peptic Ulcer. A Clinical Evaluation with Gastric Secretory, Motility and Gastroscopic Studies. Report of 60 cases, Am. J. M. Sc. 232:156 (Aug.) 1956.

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(Continued from Page 384)

Dr. Edward J. Detjen, Bigfork, escaped injury in late March when his plane landed on the soft ice of Grave Lake north of the Suomi community, when he was responding to an emergency call in that area. The plane was not damaged, but bogged down in soft slush, and Dr. Detjen had to walk more than three miles to make his call.

* * *

Jack W. Rivall, assistant superintendent of St. Luke's Hospital, Duluth, took over his new duties as superintendent of Doctor's Memorial Hospital, on May 1. Mr. Rivall, who is a native of Hibbing, is a graduate of Carleton College and has a master's degree in hospital administration from the University of Minnesota.

* * *

Austin is the new location of Dr. Herman Miller, formerly of Grand Meadow, who has just been released from the U. S. Air Force. He is a graduate of the University of Minnesota Medical School, and while in the air force served as base surgeon at Bossier Base, Shreveport, Louisiana.

* * *

Dr. E. A. Meyerding, executive secretary of the Minnesota Tuberculosis and Health Association for the past thirty-three years, has announced his resignation, effective April, 1958. He gave ill health and his age of seventy-seven as the reasons for resigning. During his tenure with the Tuberculosis Association, he has seen the Minnesota death rate from tuberculosis drop from 69.5 per 100,000 population in 1924 to 4.6 per 100,000 population in 1954. Dr. Meyerding was executive secretary of the Minnesota State Medical Association from 1924 to 1937.

* * *

Dr. D. Morrison Masson, senior consultant in the Section of Internal Medicine at the Mayo Clinic, was honored at a dinner given by his associates at the time of his retirement from the Clinic staff, March 31, after thirty-six years of service.

* * *

Aitkin will have two more doctors within the near future, when Drs. George Pettersen and Richard Burman, both University of Minnesota graduates, arrive June 1 and July 1, respectively, to begin practice. Dr. Pettersen, who is a native of St. Paul, has practiced for four years at Mabel and is completing a year's training in surgery at Bethesda Hospital, St. Paul. Dr. Burman, who is a native of Aitkin, will arrive July 1 upon completion of his internship at Bethesda Hospital.

* * *

Dr. Edgar V. Allen, internist of the Mayo Clinic, professor of medicine in the Mayo Foundation, and president of the American Heart Association, spoke on "The Meaning of Research" before the regional meeting of members of the staffs of heart associations affiliated with the American Heart Association in Omaha, Nebraska, on March 20.

* * *

Two new consultants and five assistants to the staff

of the Mayo Clinic were announced in late March. Named to the staff are **Dr. Howard R. Terry, Jr.**, in anesthesiology, and **Dr. Richard W. Weeks** in general medicine. The newly-appointed assistants to the staff are **Drs. Leonard A. Aaro**, obstetrics and gynecology; **Thomas L. Brannick**, psychiatry; **Homer R. Goehrs**, medicine; **Robert E. Lee**, radiology; and **Robert E. Yoss**, neurology.

* * *

Dr. E. Jane Watson, who has been associated with the Rochester State Hospital since January, 1956, took over her duties as assistant professor in psychiatry at the University of Chicago on April 1. She will work jointly in the departments of child psychiatry and education, and will do teaching and research in connection with the orthogenic school.

* * *

The Greater St. Paul Community Chest and Council at its recent annual meeting paid tribute to **Dr. Robert Rosenthal**, a member of the Public Health Council, and presented him with an award for "outstanding service in planning for human needs."

* * *

Dr. George M. Higgins, who retired from the Mayo Clinic staff in December, 1955, after twenty-four years of service, has returned to Rochester after spending six months in Houston, Texas, where he served on the teaching staffs of the University of Texas and Baylor University. In September he will return to Houston to teach for another seven months. While in Rochester for the summer, Dr. Higgins will continue his affiliation with the executive committee of the Methodist Hospital.

* * *

The American College of Allergists at its thirteenth annual meeting in Chicago, March 14-16, elected **Dr. Giles A. Koelsche** of Rochester as first vice president. Dr. Koelsche is assistant professor of medicine in the Mayo Foundation and consultant to the division of medicine in the Mayo Clinic.

* * *

At a recent meeting of the American Heart Association, **Dr. Joseph F. Borg**, Saint Paul, was elected to membership of the Executive Committee of the Scientific Council of the American Heart Association.

* * *

The American Foundation for Allergic Diseases has appointed **Dr. William Sawyer Eisenstadt**, Minneapolis, as chairman for the state of Minnesota.

* * *

The thirty-third Kober Lecture at Georgetown University, Washington, D. C., was delivered recently by **Dr. Winchell McK. Craig**, head of the Section of Neurosurgery at the Mayo Clinic from 1946 to 1956 and professor of neurosurgery in the Mayo Foundation Graduate School, University of Minnesota. His subject was "The Challenge of Pain Syndromes."

* * *

Approximately 600 physicians attended the Mayo Clinic Clinical Reviews for general practitioners, April 1-3. During the three-day session, thirty-four talks were given on a wide variety of medical subjects designed especially to satisfy the needs of the physician

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who practices general medicine largely with his own resources. Lectures, discussions, medical motion pictures, and medical exhibits were the instruction media used. Staff members of the Clinic serving as instructors were Drs. Edward A. Banner, Haddon M. Carryer, Edwin D. Bayrd, B. Marden Black, James T. Priestley, Robert L. Parker, J. Arnold Borgen, Clark H. Millikan, Raymond J. Jackman, John R. McDonald, and Herman J. Moersch.

* * *

A former fellow in the Mayo Foundation, Dr. Ralph M. Beddow, has been named acting medical director of Queen's Hospital in Honolulu, Hawaii. Since completing his fellowship in medicine at Rochester, Dr. Beddow has been at Queen's Hospital where he has been head of the outpatient department and chief medical resident.

* * *

On April 8, 1957, Dr. C. J. Watson, head of the University of Minnesota Medical School's department of medicine, delivered the John Phillips memorial lecture before the American College of Physicians in Boston. His subject was "Some Challenging Aspects of Hemoglobin Metabolism."

* * *

In addition to Dr. A. I. Rajala of Grand Rapids, who holds office hours at Floodwood, Minnesota, on Fridays, Dr. R. T. Kelly of the Itasca Clinic is now having Tuesday hours in the Floodwood community.

STATISTICS ON OBSTETRICAL COSTS, HOSPITAL OCCUPANCY

(Continued from Page 340)

cent recommended by the American Hospital Association and the U. S. Public Health Service. Occupancy figures have been averaging well over the 90 per cent mark since January.

CONTRIBUTIONS TO MEDICAL SCHOOLS INCREASE

A recent report shows that contributions in 1956 to the nation's 82 medical schools totaled \$1,862,016 from 1,737 business and industrial organizations, states the chairman of the National Fund for Medical Education.

Seventy-three life insurance companies headed the list with \$313,702; fifty-one pharmaceutical companies were next with \$198,205. Petroleum and natural gas companies were third. Twenty automobile companies gave \$132,900; sixty-seven chemical companies gave \$123,930, and sixty-seven iron and steel companies gave \$120,320.

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BLUE CROSS-BLUE SHIELD NEWS

Blue Cross subscribers are utilizing their coverage at an ever-increasing rate. During the first two months of 1957, 203,772.2 days of hospital care were provided for 32,990 participant subscribers compared to 181,708.5 days of care provided for 29,571 participant subscribers during the same period of time of the previous year.

Although some of this increase in Blue Cross activity is attributable to growth in enrollment, the number of cases paid per 1,000 contracts protected increased from 456 per 1,000 contracts to 477 per 1,000 contracts for these periods of comparison. In addition the average length of hospital stay shows a one-tenth of a day increase over the same period of the previous year.

The type of hospital case showing the greatest increase in number is accident cases. During these first two months of 1957, Blue Cross has provided care for 500 more persons per month than during the same period of 1956.

Blue Cross benefits per day averaged \$1.75 higher during January and February 1957 compared to the same period of 1956. Here again these increased benefits can be attributed both to our policy of offering a higher benefit level of contract and also to increases in hospital costs. Hospital charges for Blue Cross subscribers indicate a \$1.11 per day increase for these periods.

* * *

Frequent inquiries from physicians regarding the availability of a Blue Shield contract for themselves and their families indicate that many doctors are not aware of the fact that they can secure either a Plan A or Plan B Blue Shield contract.

The Blue Shield Board of Directors made Blue Shield contracts available to doctors in February of 1956, and many doctors now have either Plan A or Plan B group contracts. Prior to this action by the Board of Directors, offering Blue Shield contracts to doctors was considered unnecessary because of the courtesy care of a physician and his family by another doctor. However, it was found that many doctors considered Blue Shield coverage a method of solving some of the embarrassments arising from the courtesy care of one physician by another, and it was also learned that most other Blue Shield Plans offer contracts to doctors.

A doctor who wishes to obtain a Blue Shield contract can do so in clinic or doctor's office personnel group, a hospital staff group, or the general medical profession group. If enrollment is not open to him through a clinic, a doctor's office personnel group, or a hospital staff group, an application blank can be obtained by writing to Blue Shield, 2610 University Avenue, Saint Paul 14, Minnesota.

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Book Reviews

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BOOKS RECEIVED FOR REVIEW

DISEASES OF THE NOSE, THROAT AND EAR.

Tenth Edition. Howard Charles Ballenger, M.D., F.A.C.S. Professor Emeritus of Department of Otolaryngology, Northwestern University Medical School, Chicago; Surgeon, Department of Otolaryngology, Evanston Hospital, Evanston, Illinois; and John Jacob Ballenger, B.S., M.S., M.D. Associate in the Department of Otolaryngology, Northwestern University Medical School, Chicago; Associate Surgeon, Department of Otolaryngology, Evanston Hospital, Evanston, Illinois. 968 pages. Illus. Price \$17.50, cloth. Philadelphia: Lea & Febiger, 1957.

EXPECTANT MOTHERHOOD.

Third Edition. Nicholson J. Eastman, M.D. Professor of Obstetrics in Johns Hopkins University; and Obstetrician-in-Chief to the Johns Hopkins Hospital. 198 pages. Illus. Price \$1.75, cloth. Boston: Little, Brown & Co., 1958.

THE RIDDLE OF STUTTERING.

C. S. Bluemel, M.D. Fellow of the American College of Physicians; Fellow of the American Psychiatric Association; Fellow of the American Speech and Hearing Association. 142 pages. Illus. Price \$3.50, cloth; \$1.50, paper cover. Danville, Illinois: Interstate Publishing Co., 1957.

MANUAL OF RADIATION THERAPY.

K. Wilhelm Stenstrom, Ph.D. Professor of Biophysics; Director, Section of Radiation Therapy, University of Minnesota Medical School. Collected by John B. Coleman, M.D., Clinical Instructor in Radiology. Revised with additions and Discussions by Paul C. Olfelt, M.D., Clinical Instructor in Radiology, and Frances Conklin, M.D. 94 pages. Illus. Price \$4.50, cloth. Springfield, Illinois: Charles C Thomas, 1957.

MEDICAL SERVICES FOR RURAL AREAS.

The Tennessee Medical Foundation. Willman A. Massie, Chairman, Health Committee, Council of the Southern Mountains. Formerly Field Secretary, The Tennessee Medical Foundation. 68 pages. Illus. Price \$1.25, paper cover. Cambridge, Massachusetts: Harvard University Press, 1957.

FIGHT FOR FLUORIDATION.

Donald R. McNeil. Associate Director of Wisconsin State Historical Association. 241 pages. Price \$5.00, cloth. New York: Oxford University Press, 1957.

CLINICAL ROENTGENOLOGY.

The Digestive Tract, the Gall Bladder, Liver and Pancreas, the Excretory Tract and Special Studies Emphasizing Differential Considerations. Volume 4. By Alfred A. de Lorimier, M.D., Henry G. Moehring, M.D., and John R. Hannan, M.D. 676 pages. 1112 illus. Price \$24.50. Springfield, Illinois: Charles C Thomas, 1956.

THE PHYSICIAN-WRITER'S BOOK. Richard M. Hewitt, M.D., Section of Publications, Mayo Clinic, Rochester, Minnesota; Associate Professor of Medical Literature, Mayo Foundation Graduate School, University of Minnesota. 388 pages. Philadelphia: W. B. Saunders Company, 1957.

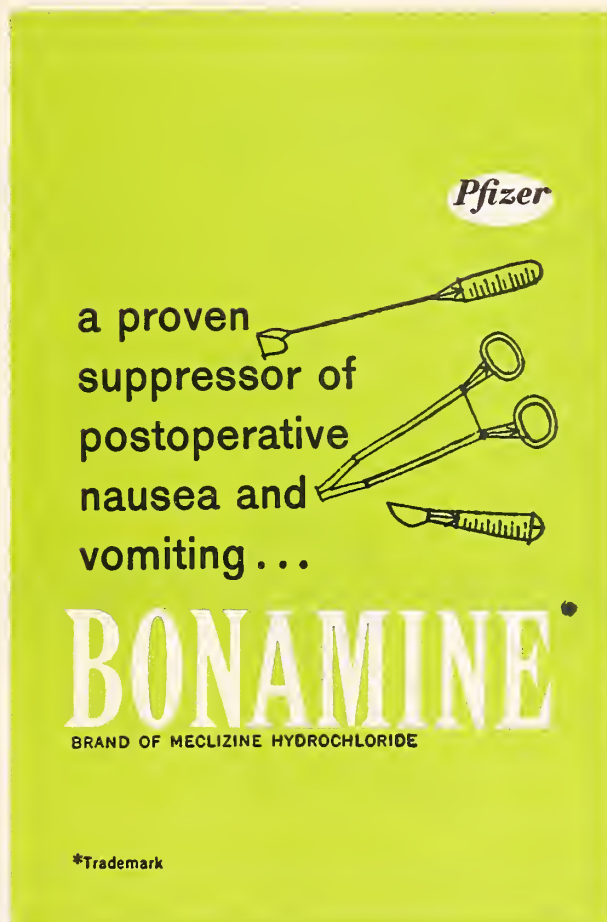
This volume is concerned with "tricks of the trade of medical writing," and is intended to be used by any physician who contemplates submitting papers to medical journals or publishers, or any physician who would like to do so but is unsure of his competence in the writing of medical papers.

The avoidance of "road blocks" to swift communication of ideas, the over-all plan of organization of a composition, common grammatical errors, the "what, when and how" of medical writing are a few of the considerations which the volume develops and explains extensively. The types of writing exemplified in parts of the book range from the basic fundamentals which are absolute requisites to the beginner to the subtle devices which mark the superlative writing of the master authors.

Two examples presented by Dr. Hewitt are taken from the Rochester *Post-Bulletin*. One, from the *Post-Bulletin* of September 14, 1951, concerns a condemnation by the late Associate Justice Theodore Christianson, of the Minnesota Supreme Court, of the "and/or" construction by legal and other writers, on the grounds of doubtful meaning and confusion. The second example is from the *Post-Bulletin* of November 27, 1950, and sets forth the reasons why the word "flammable" is preferable to "inflammable."

The "Physician-Writer's Book" reflects Dr. Hewitt's career in medical writing and medical literature. A graduate cum laude of Wesleyan University in Middletown, Connecticut, he took a master's degree in English at Princeton University before he began to study medicine, and for two years he was also an English teacher in the Sanford School at Redding Ridge, Connecticut. After service in the Army Medical Department in World War I he entered the George Washington University Medical School in Washington, D. C. from which he received the degree of doctor of medicine in 1924. In 1924 and 1925 he served an internship at the Gorgas Hospital in the Canal Zone, Panama, and from 1925 to 1928 he was assistant editor of the *Journal of the American Medical Association* in Chicago.

Dr. Hewitt came to Rochester in 1928 as associate medical editor in the Section of Publications of the Mayo Clinic. He became head of the section in 1933, and became a senior consultant in 1949. During World War II he did editorial work as a member of the Committee on Information, Division of Medical Sciences, National Research Council, as well as similar work for the Office of the Surgeon General of the Army and for the War Manpower Commission. In 1956 he was elected president of the American Medical Writers' Association. He has lectured and written extensively on medical writing and publishing.



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Original Contributions

The Management of Nodular Goiter

OLIVER H. BEAHRS, M.D.
Rochester, Minnesota

ANY THYROID gland that on clinical examination contains a tumor or tumors, presents an irregular outline, and is asymmetric might be considered to be a nodular goiter. The pathologic processes responsible for these findings include fetal and involutional adenomas, various forms of thyroiditis and carcinoma.

The management of nodular goiter is a controversial subject. The argument revolves mainly around two points, namely (1) whether the incidence of thyroidal carcinoma associated with nodular goiter and the potential hazard of this condition are sufficiently great to justify treatment for an asymptomatic nodular goiter, and (2) the extent of the surgical procedure when a nodular goiter is found to be malignant.

Surgical Versus Nonsurgical Treatment

Support can be found in the current literature for radical surgical treatment^{1,2} of malignant tumors of the thyroid as well as for the opposite view of no treatment at all.³⁻⁵ It is difficult to evaluate statistics regarding nodular goiter and cancer, since the background and approach to the problem are not the same in each study. Factors related to the selection of patients are present whether or not such factors are admitted. Such selection results from clinical suspicion as to the type of goiter present, the limitation of the number of hospital beds, whether the patient is being seen privately or in a teaching or charity practice, the economic status of the patient and the philosophic approach of the physician. The statistics from a series of cases of goiter from a metropolitan charity institution are weighted by symptomatic goiters or those in which the suspicion of

cancer is great, while data from private practice or clinics are more likely to be diluted by asymptomatic goiters, most of which are removed for prophylaxis. The philosophy regarding the management of nodular goiter emanating from an individual institution is based on the experience of the physicians practicing in that institution. The type of patient, the location of the practice and the safety of the surgical techniques, as well as the dangers of the disease being treated, are all taken into consideration. Prophylactic surgical intervention is justified only if the risk of the disease, if left untreated, is greater than the risk of the treatment, including consideration of the practicability of the treatment and the economics involved.

The incidence of nodular goiter in the general population is not known. The estimate that 10 to 15 per cent of adults have nodular goiters that can be detected clinically probably is fairly accurate. However, Mortensen and associates⁶ found that 525 of the thyroid glands in 1,000 consecutive necropsies contained grossly evident nodules. This might indicate that as many as 50 per cent of people have pathologic nodules in the thyroid gland. Of course, the removal of millions of goiters on prophylactic grounds would be entirely impracticable, especially since the risk of subsequent complications as the result of retaining these goiters is not great.

Factors in Selection of Treatment

Some potential hazards must be considered in making a decision as to the management of these lesions. These hazards include the chance of subsequent development of hyperthyroidism, the risk of malignant changes in the thyroid and the possibility of mechanical pressure on structures of the neck. Another factor is the cosmetic appearance of the goiter. Too frequently, only one of these factors is considered in the management of nodu-

Presented before the Minneapolis Surgical Society, October 4, 1956.
Dr. Beahrs is in the Section of Surgery, Mayo Clinic and Mayo Foundation.
The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.

lar goiter. Actually, all of them should be weighed in making the final decision as to what recommendation to give the patient.

Hyperthyroidism.—A definite figure cannot be given for the number of patients with adenomatous goiter who eventually will have hyperthyroidism. Most physicians have seen patients in the later years of life who have fibrillation, cardiac decompensation and other evidences of adenomatous goiter with hyperthyroidism. Review of the histories of such patients often discloses that a goiter has been known to have been present for as long as twenty years or more. When the goiter was first recognized, it could have been removed with minimal risk but now the patient is older and seriously ill; thyroidectomy now imposes a considerably increased risk to the life of the patient. It has been variously estimated that hyperthyroidism will develop in 30 to 50 per cent of patients who have adenomatous goiters and who are left untreated. The actual figure probably is considerably smaller but still large enough to be of real significance in any decision concerning the management of patients with nodular goiter.

Carcinoma.—Considerable controversy revolves around the incidence of carcinoma in nodular goiter. The unresolved questions are: 1. Does the chance of the occasional discovery of carcinoma warrant prophylactic thyroidectomy? 2. Does carcinoma of the thyroid warrant surgical treatment?

In a review made in 1951 of a series of 342 cases at the Mayo Clinic in which a clinical or pathologic diagnosis of malignant disease of the thyroid gland was made, it was found that the condition was inoperable in 35 per cent of these cases.⁷ This is a shockingly large incidence when it is realized that the majority of these patients could have been treated adequately if seen earlier.

For many years at the clinic, the incidence of carcinoma of the thyroid gland in surgically removed nodular goiters has been 4 to 5 per cent.^{8,9} This figure is comparable with data reported by other investigators. It is not of clinical significance, however, in that it includes nodular goiters in which the presence of carcinoma was known or suspected before operation and also those in which carcinoma was found incidentally at the time of prophylactic thyroidectomy. A goiter that is known or thought to be malignant will, of course, be

treated. The figure that is of interest in the management of nodular goiter is the frequency with which carcinoma occurs in nodular goiters that are asymptomatic and not suspected of containing carcinoma. My associates and I⁸ have found this figure to be 3.8 per cent. We also found carcinoma in 1 per cent of surgically removed adenomatous goiters associated with hyperthyroidism. As already noted in the aforementioned study of Mortensen's group, 525 of 1,000 thyroids examined at routine necropsy contained single or multiple nodules; primary carcinoma was found in twenty-eight of these glands, an incidence of 5.3 per cent. Metastatic lesions in the thyroid gland from other sources were noted in eighteen other cases. My colleagues and I consider that these figures are sufficiently high to warrant thyroidectomy for most patients who have nodular goiter.

It is difficult to establish accurately on clinical grounds whether or not a goiter contains a single nodule or multiple nodules. When only a single nodule is thought clinically to be present, the pathologist frequently finds multiple nodules when he examines the surgical specimen. Because of this difficulty, we have not made a clinical separation of our cases of nodular goiter into those with single nodules and those with multiple nodules. However, it is reasonable to assume that the chance of malignancy is greater if a discrete palpable nodule is separate from the thyroid gland or from other nodules. Reports of series of such discrete single nodules have indicated that the incidence of carcinoma among these might be as much as 20 per cent.¹⁰

The incidence of carcinoma in nodular goiter is considerably greater in children than it is in adults. Hayles and associates¹¹ found approximately a 50 per cent incidence of carcinoma in nodular goiter in a group of children less than 15 years of age studied at the clinic. Because of this great incidence, any nodule in the thyroid gland of a child should be considered carcinoma until proved otherwise.

Malignant thyroidal tumors may be grouped into two categories, namely (1) the highly anaplastic lesion, for which little can be offered in the way of surgical treatment, and (2) the slowly growing papillary and follicular lesions. The latter group is of more surgical importance; 60 to 70 per cent of carcinomas of the thyroid fall into this category.^{7,8}

Papillary lesions are extremely slow in growth and frequently spread into the tracheo-esophageal and cervical groups of lymph nodes. Opinions regarding the management of these tumors vary from total thyroidectomy and radical dissection of the neck to no surgical treatment at all. My associates and I take a middle-of-the-road position and consider that the results justify this position. Removal of primary thyroidal carcinoma by total lobectomy on the side of the lesion and subtotal lobectomy on the opposite side constitutes adequate treatment of these lesions unless the trachea or esophagus is involved. Radical dissection of the neck is considered advisable only when massive involvement of the cervical lymph nodes is present. If no nodes are felt clinically or at the time of operation, the surgical procedure is not extended into the lateral aspects of the neck. If one node or a group of nodes is involved, then a modified dissection of the neck is done, with removal of only the involved and adjacent tissue. In a review of 174 cases of papillary carcinoma of the thyroid gland with follow-up periods of five to fifteen years, it was found that in no instance had we lost control of the lesion in the lateral aspects of the neck by inadequate surgical intervention in this region.

We do not agree with those who are of the opinion that carcinoma of the thyroid does not require surgical treatment. These lesions will kill the patient if they are left alone. We do not perform needle biopsy of the tumor in the thyroid gland because we consider that inadequate tissue frequently is obtained and that there is risk of seeding carcinomatous cells into the tissues. We prefer to expose the nodule and perform an adequate resection for diagnosis.

Pressure.—In this modern era, physicians see few large goiters causing significant pressure on or distortion of the trachea. However, there is always the occasional case in which the airway is compromised by a large goiter or by one impinging on the thoracic inlet. Progressive obstruction of the airway is most dramatic and requires emergency measures if disastrous results are to be prevented. This hazard also must be considered in the management of patients with nodular goiter. Unfortunately, some patients neglect to seek medical advice until treatment is urgent and has to be carried out at an increased risk to the patient.

Prognosis and Complications in Thyroidal Surgery

The present-day risk of competent thyroidal surgery is extremely low. For asymptomatic nodular goiter, it should approach zero. The over-all mortality rate in 8,972 cases in which thyroidal operations were done at the clinic from 1946 to 1955, inclusive, was 0.1 per cent.¹² Only one death occurred in 4,919 thyroidectomies in patients who had adenomatous goiter without hyperthyroidism. The patient who died was a seventy-four-year-old woman who had a large goiter causing tracheal compression; the goiter was removed satisfactorily but the patient died from a cerebrovascular accident during the postoperative course.

The morbidity associated with prophylactic thyroidal surgery is minimal. Only one instance of permanent postoperative tetany occurred in 566 patients operated on at the clinic in 1954 for adenomatous goiter without hyperthyroidism.¹² The incidence of paralysis of a vocal cord in the same group of patients was less than 1 per cent. Myxedema is an uncommon complication in patients who are operated on for adenomatous goiter. However, myxedema occurs postoperatively in 30 to 50 per cent of patients who have thyroiditis. The incidence of myxedema also is high in patients with thyroiditis who are not treated surgically. Postoperative hemorrhage is a problem on extremely rare occasions. The vast majority of patients undergo thyroidal surgery satisfactorily and have a rapid and complete recovery.

Nonsurgical Treatment

A small number of nodular goiters can be treated by nonsurgical methods. The nodular goiter of lymphocytic thyroiditis, diagnosed on clinical grounds or by needle or surgical biopsy, often decreases in size or disappears when the patient is given adequate amounts of desiccated thyroid. A few patients who have adenomatous goiter with hyperthyroidism are treated by means of radioactive iodine. As information regarding the uptake of radioiodine by thyroidal nodules increases, more adenomas probably will become amenable to such therapy. At the present time, however, surgical intervention should be considered the treatment of choice for the great majority of symptomatic and asymptomatic nodular goiters.

(Continued on Page 406)

Injuries of the Genito-Urinary System

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WAR INJURIES, we all hope, will not concern us in the near future; however, if such should occur, the scope of this presentation on genito-urinary injuries will apply. Those injuries seen by us now are the result of modes of transportation, industrial accidents, and the various incidents involving a slip or fall, or a stabbing or gunshot wound. The surgeon, himself, is not immune to producing trauma to the urinary system and neither is the urologist. The laboring and parturient female may encounter sufficient trauma to produce minimal to serious damage to the urinary tract. Irradiation must also be considered as a factor in injury. Injuries are not frequent to the urinary system, but with increased horsepower, increased production, and the means to achieve such, and with more radical surgical methods at hand, one may expect an increase in the future.

Nonpenetrating injuries are seen more commonly than the penetrating variety, and it must be remembered that the distended or abnormal organ is more susceptible and more likely to be injured than the lax or normal one.

Injuries to other body structures, and hemorrhage, with or without shock, are usually associated with urinary tract damage, and may require the emphasis of initial effort of care. A high index of suspicion will make an early diagnosis, and prompt treatment of the urologic problem is then mandatory in preventing or reducing late complications and saving life. Fine judgment is required for the proper timing of diagnostic studies and the correct therapy for the findings of such studies.

Injuries of the Kidney

Injuries to the kidney vary from mild contusions to complete maceration of the entire renal parenchyma, and it is amazing that such a vascular, friable, and mobile organ suspended in fat is not injured more frequently. The majority of injuries occur to the male because of greater vocational exposure, more strenuous physical activity, and the less flexible muscular fixation of the kid-

ney. The kidneys are positioned partially in the thoracic cage shielded by the ribs, the lumbar spine, and the vertebral and abdominal muscles, and are protected anatomically from most ordinary or moderate injuries. Trauma of sufficient force to fracture ribs may force fragments of bone into the kidney substance, or the kidney may be pressed against the vertebral column. The normal mobility of the kidney aids in preventing the full impact of trauma upon it.

Injuries to the kidney are either open or penetrating. In peacetime, the majority of renal injuries are the closed type from transportation, or industrial accidents, athletic activities, or other severe direct force over the renal region. Many of these injuries are slight, causing some pain and hematuria and requiring only expectant treatment. Many civilian accidents, like those with wartime trauma, are so completely devastating that death occurs before focus is brought to possible renal damage. Injury by fall, even of short distance, on the feet, buttocks, or shoulders, may cause indirect renal damage by the mechanism of sudden snap, stop, and flexion, on a downward moving kidney. Instances have been reported where the renal pedicle has been completely torn from the central vascular supply of the body. Renal injuries due to penetrating wounds are rare in peacetime, and are frequently overlooked because of serious and more pressing injuries of adjacent viscera. The urologist may injure the kidney parenchyma, renal pelvis or ureter, during cystoscopic manipulations, particularly with stiff or stiff ureteral catheters, stone baskets, or with overdilatation of the renal pelvis with constant material during pyelography.

Continued advances in urologic diagnosis, use of new therapeutic agents, abundant blood transfusions, more conservative and better timed surgical procedures based on keen judgment have all reduced the initial gravity and late complications of renal trauma.

Closed injuries of the kidney range from minute

subcapsular hemorrhage to total disruption of the parenchyma, with or without injury to the pelvis and vascular pedicle. Perirenal trauma may occur without damage to the kidney or its capsule

usually seen, providing the ureter or pelvis is not obstructed by clot, or a reflux anuria has not occurred. The renal capsule is a most resistant membrane remaining intact following even mod-

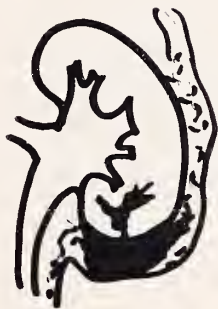


Fig. 1. (*upper left*) Rupture of perirenal fat and contusion of kidney.

Fig. 2. (*upper right*) Rupture of parenchyma of kidney and renal capsule with communication with renal pelvis.

Fig. 3. (*lower left*) Multiple ruptures of renal capsule and renal parenchyma with perirenal hemorrhage.

Fig. 4. (*lower right*) Rupture of parenchyma without communication with collecting system.

Fig. 5. (*upper left*) Rupture of parenchyma with bleeding into collecting system.

Fig. 6. (*upper right*) Multiple rupture with fragmentation of kidney.

Fig. 7. (*lower left*) Rupture of vascular pedicle.

Fig. 8. (*lower right*) Rupture of kidney parenchyma and renal pelvis with intraperitoneal extravasation.

and usually presents bleeding with consequent pain and regional enlargement, but seldom with changes in the urine itself. The hemorrhage usually absorbs and does not require open surgical care, but may complicate itself in perirenal hematoma or perinephritis.

Simple contusions of the kidney (Fig. 1) with few to many subcapsular superficial tears of the parenchyma occur frequently. This injury causes brief transient hematuria and some renal pain, and requires no surgical intervention, only observation. The excretory urogram is normal.

With rupture of the parenchyma, perirenal hemorrhage may be marked and hematuria is

erate trauma. The capsule will contain diagnostic radiopaque solution within the renal outline, but with rupture of the capsule the contrast media will extravasate to the perirenal area (Figs. 2, 3, and 4). If the capsule is not torn (Fig. 5), mild to moderate subcapsular hemorrhage is present, but with parenchymal tears involving the capsule, hemorrhage is more severe and may be quickly fatal. One or both poles may be torn from the kidney, usually in a transverse plane, opening the larger arcuate and interlobular vessels. Rarely will urine be found in the wound, unless the tear extends into the pelvis or calyces, for lacerated renal tissue is not usually capable of secreting

urine. It is well to remember that spontaneous rupture occurs in hydronephrotic or pyonephrotic kidneys, and a diseased kidney may be damaged by only minimal trauma.

The completely perforating injury is the most common penetrating wound of the renal parenchyma and the wounds may be slight, especially those in which the edges or renal poles are damaged, but complete destruction of either pole or extensive shattering of the kidney (Fig. 6) may also occur as seen in the closed type lesion. When the central portion of the kidney is injured, the damage is severe and terminates in nephrectomy.

In hilar wounds (Fig. 7), the renal artery or one of its branches may be divided, and the patient usually dies before the diagnosis can be made and treatment by nephrectomy given. Small veins have been known to anastomose after injury, but renal arteries do not; consequently, division of the small arteries causes extensive cortical necrosis. A missile will rarely injure the kidney or its accompanying structures without passing through the abdomen or chest cavity, and the need for immediate surgery of these extrarenal organs is of greater emergency than the care of the kidney itself. Hematuria, pain, and abdominal rigidity of varying degree are present in most instances. Abdominal relaxation sufficient to permit accurate palpation of the renal region does not occur, but occasionally an easily felt large mass in the flank is found, indicating perirenal bleeding. Hemorrhage is the most serious problem in the hilar wounds, and may cease spontaneously by increased pressure in the restricted perirenal space. Urinary extravasation is not marked unless there are extensive pelvic or ureteral tears. Associated rupture of the peritoneum (Fig. 8) allows blood and urine to drain from the closed lumbar space into the peritoneal cavity, and thorough cleansing of the peritoneal cavity must be accomplished at the time of surgery. Intraperitoneal rupture may be rapidly fatal, especially if urinary infection is present.

In all renal injuries, microscopic to massive hemorrhage is present but may not occur immediately. Red cells may disappear for several days after injury, and then recur spontaneously or after exertion. The absence of hematuria may be due to division of the ureter of the damaged kidney, to obstruction of it by clots or fragments of renal tissue, or to extensive damage to the renal pelvis

itself. Customarily, shock is present, and shock developing several days after the initial injury indicates recurrent or increased bleeding. Where injury to the thorax, abdominal viscera, or spinal cord is associated, severe shock is usually present. In the uncomplicated renal injury, the severity of the shock should not be used as an index of the extent of renal damage.

The diagnosis is made on history of injury with subsequent pain in the injured side, mass in the lumbar area, and microscopic or gross blood in the urine. In all instances of abdominal injury, even though no evidence of renal trauma is present, catheterization should be done, if necessary in the male, and always in the female to obtain a specimen for analysis. Pyuria on the initial specimen suggests previous renal disease, but is commonly present several days after injury. A KUB film, portable if necessary, should be done in the presence of extensive secondary injuries which prohibit more detailed urologic studies. Haziness of the renal outline, obliteration or distortion of the margins of the psoas muscle, and/or deviation of the spine away from the involved side, suggests hemorrhage in the perirenal area (Fig. 9). Enlargement of the kidney shadow itself suggests a subcapsular hematoma. Fractures of the vertebrae or bony pelvis may also be seen on this initial film. Excretory urography provides fairly definite information, and more extensive diagnostic procedures may be avoided if this series of films is conclusive. In addition, the possibility of a solitary kidney should be considered, and the excretory study will define the presence and the function of the contralateral kidney. Lack of renal blood flow and consequent decrease in the secretory power of the kidney is present in shock, and the excretory study may be totally nondiagnostic. The injured kidney functions when the renal tissue and its blood supply are intact, but during the period of recovery the secretory and absorptive action of the damaged kidney and the contralateral kidney is inferior to the immediate post-traumatic ability to function. Therefore, excretory urography should be done early to gain the most reliable information. Cystoscopic study, with occlusion ureteral-pyelography with an acorn type catheter may be necessary to establish the correct diagnosis, and will very definitely illustrate ureteral injury. Cystoscopy is hazardous in the shock state or with extensive body injuries, and recurrence of bleeding may follow

instrumental manipulation or moving the patient for the procedure. The risk of infection from cystoscopy and pyelography is minimal, and should be disregarded when an attempt at a definite diagnosis is being made.

lumbar incision should be made which will permit evacuation of clots, visualization of the kidney, adequate drainage of the involved area, and the surgical procedure of choice. The lower angle of the incision can then be extended transversely,

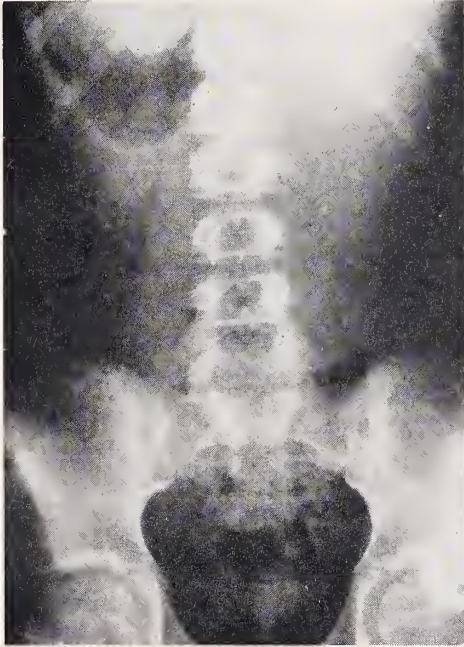


Fig. 9. KUB film demonstrating haziness of renal outline, obliteration of psoas muscle, and deviation of spine away from the involved side.

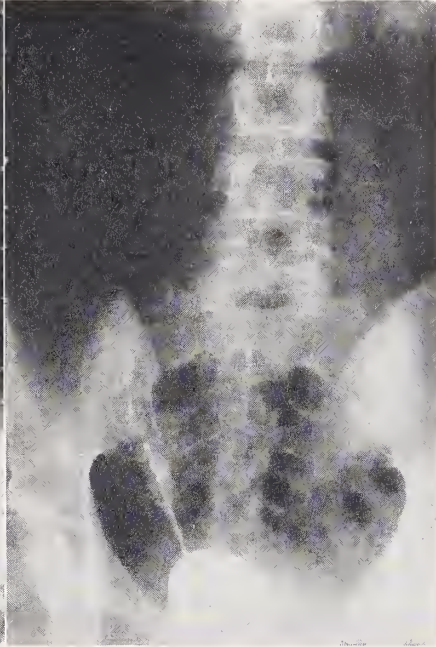


Fig. 10. Ureterogram of ureter injured by crushing with forceps at time of hysterectomy.

In general, treatment of renal trauma is less urgent than that of complicating lesions, but the important decision is whether exploration of the renal region is required, and, if so, when. Some urologists feel a history of renal trauma with hematuria for a twenty-four-hour duration indicates need of exploration, and others favor cautious delay. Judicious delay allows the patient time to recover from shock, and during this period some of the diagnostic procedures can be carried out. If exploration is finally necessary, surgical hemorrhage is usually less in amount than it would have been immediately after injury. Persistent hematuria, signs of infection, shock or internal hemorrhage, all indicate extensive damage, and exploration is mandatory. Hematuria may not be sufficient reason for early exploration, for primary hematuria many times will cease twenty-four to forty-eight hours after injury, but if it persists and is profuse the kidney should be explored. Urinary extravasation requires prompt and extensive drainage of the area. If exploration is warranted, an adequate

the peritoneum opened, permitting examination of the abdominal viscera and any required abdominal surgery. In primary transperitoneal exploration with probable renal damage, exploration of the renal region by this approach is not advisable for it opens a poorly drained field, readily contaminated by intestinal spillage. If laparotomy indicates exploration of the renal fossa is necessary, a second incision should be made using the lumbar approach, or, if this is not feasible at the time, a generous stab wound can be made in the lumbar area and drained with a large caliber, many-holed catheter or a number of Penrose drains, until the patient's condition stabilizes from the transperitoneal procedure.

The usual surgical procedures for trauma of the kidney are: (1) drainage of the renal region, (2) partial nephrectomy or repair of the injured kidney, or (3) nephrectomy. Drainage is the most satisfactory procedure when shock is present or exploration urgent, for it permits inspection, evacuation of blood clots, and control of hemorrhage

quickly with only minimal risk to the patient. Foreign bodies and loose tissue fragments should be searched for and carefully removed at the time. Drains, including nephrostomy, should be placed

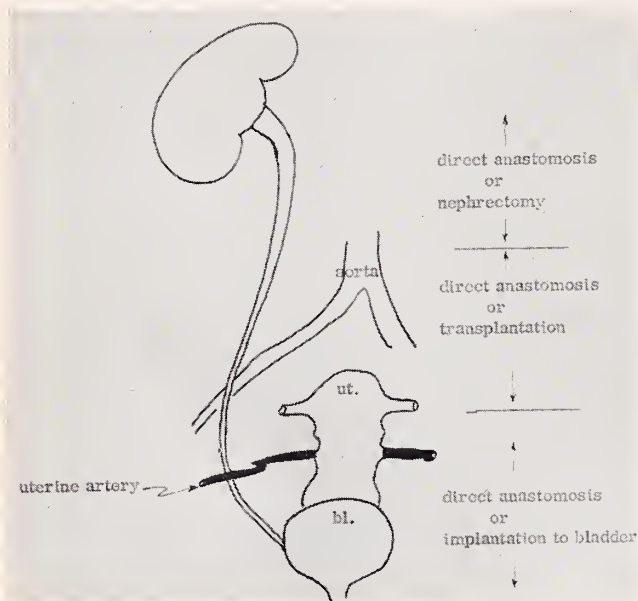


Fig. 11. Sites of ureteral injuries and methods of repair.

freely, but carefully, to reach all parts of the wound. Partial nephrectomy, renal repair, and reconstructive operations, can be considered for closed, uninfected, renal rupture, but are fraught with complications for infected penetrating wounds. In marked destruction of renal parenchyma, extensive reconstructive surgery usually results in a poorly functioning or functionless kidney with eventual nephrectomy. With partial nephrectomy, or suture, parenchymal infections, necrosis, and late bleeding may necessitate secondary nephrectomy. The kidney must be removed in cases of constant hematuria, multiple deep lacerations of the parenchyma, or damage to the vascular pedicle. If the ureter is severed, the pelvis torn, and the kidney severely lacerated and with urine escaping from the wound, late results are a nonfunctioning or persistently infected kidney. Nephrectomy is a simpler procedure than most conservative or repair operations, and usually is the final result anyway at a later operation, if primary repair is attempted.

A general outline for control of renal trauma is as follows:

1. Accurate history and careful examination.
2. Complete blood count, hematocrit, and urinalysis with urine culture and sensitivity studies.

3. Immediate treatment of shock with plasma until blood is available.
4. Excretory urography when systolic pressure reaches 90 mm.

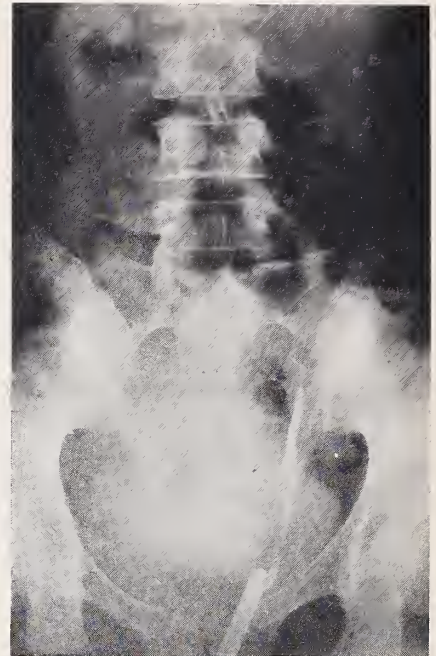


Fig. 12. Occlusion type ureterography with an acorn type ureteral catheter impacted in the ureteral orifice of the injured side, demonstrating flow of contrast material retrograde in ureter to site of ligation at time of hysterectomy.

5. Cystoscopy and occlusion ureteral-pyelography if excretory series is not diagnostic.
6. If nonsurgical—bedrest, daily blood count, hematocrit, and urinalysis.
7. Surgery, if indicated—procedure of choice to be determined at time of exploration.
8. Generous use of antibiotics.
9. Excretory series frequently in postoperative period.

Injuries of the Ureter

The course of the ureter is remarkably well protected from accidental trauma and injury from external violence, except from the rare penetrating wound. Conversely, various means of intra-ureteral manipulation through the cystoscope, and extensive pelvic surgery constitute a tragic, not infrequent, source of ureteral injury. Ureteral injuries from external trauma are frequently overlooked, for the usually critical accompanying visceral injuries preclude early recognition of the lesion, and the severity of abdominal symptoms or fractures may entirely mask the evidence of ureteral injury. External penetrating injuries involving the ureter are confined to gunshot and stab

wounds; however they have been reported with fractures of transverse processes of the lumbar vertebrae.

Accidental surgical ureteral injury occurs during right colectomy, combined abdominal-perineal resection and with both simple and radical gynecologic operations. The injury may vary from excision of a sizable segment of ureter to minimal clamping, crushing, or ligation (Fig. 10). Most ureteral injuries are not suspected at the time of initial surgery and are recognized in the immediate or late post-operative period by a urinary extravasation, pain, sepsis, anuria, or fistula formation.

Attention is first directed to the control of shock, after which the manner of treating the ureteral injury depends upon the location, the extent of injury, and the time the lesion is discovered, after the original trauma (Fig. 11). When shock has been completely controlled, excretory urography and subsequent cystoscopic study with occlusion ureteral-pyelography must be done. The pelvic portion of the ureter is more frequently injured in penetrating wounds for in this location the ureter is fixed, relatively inelastic, and poorly protected by other structures. Damage to the vascular supply to the lower extremities may be so great that the diagnosis of severed ureter is made at autopsy. Extravasation of urine from ureteral injury, without drainage, is much less severe than extravasation from the bladder or urethra. When the ureter has been injured and tissues have obliterated the path of the bullet or other missile, extravasation of urine forms a mass in the adjacent area with sepsis, and usually results in fistula formation, which is the late characteristic sign of an unrecognized ureteral injury.

If injury is suspected, an immediate excretory urographic series should be made, not only to determine the possible site of the injury but to determine the function of the contralateral kidney. This should be followed by cystoscopic study with occlusion ureterography with an acorn type ureteral catheter impacted in the ureteral orifice of the injured side (Fig. 12). An attempt should be made to pass an indwelling ureteral catheter, and even though this does not reach the renal pelvis and is passed only to the site of obstruction it should be left indwelling and immediate exploration carried out. Only rarely is bilateral ureteral ligation seen, and this usually follows an extremely difficult vaginal hysterectomy, or occasionally a cystocele repair.

If the diagnosis of injured ureter is made at the time of the initial operative procedure, an indwelling ureteral catheter should be passed as a splint and left indwelling for seven to ten days after

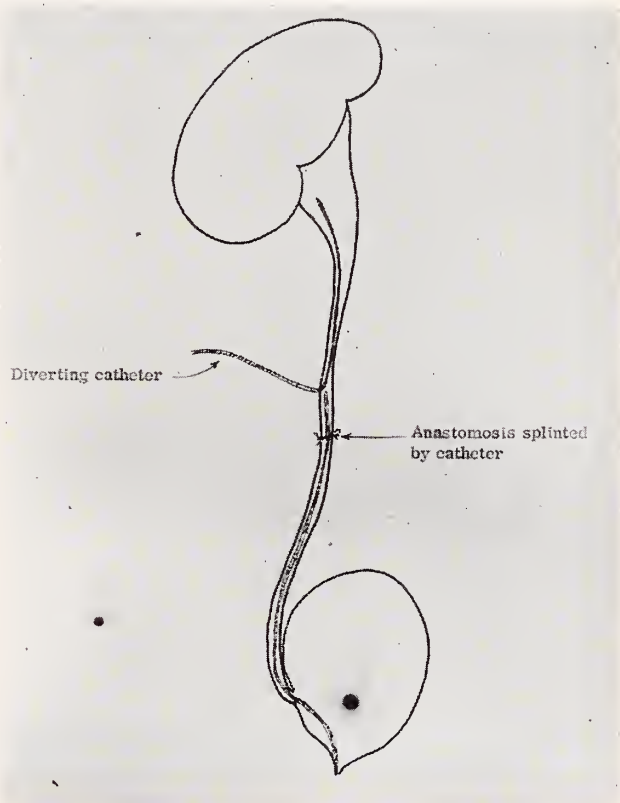


Fig. 13. Repair of mid-ureteral injury with a diverting ureterostomy by indwelling ureteral catheter placed to the renal pelvis and an indwelling ureteral catheter placed proximal to the site of injury and anastomosis.

anastomosis at the site of injury has been completed and a diverting ureterostomy established. In injury of the upper third of the ureter a direct anastomosis may be completed if the injury is early; however, at a later stage preliminary nephrostomy may be necessary, followed by an attempt at direct anastomosis. If anastomosis is unsuccessful, nephrectomy is inevitable. In mid-ureteral injury (Fig. 13), direct anastomosis over a splinting catheter with a diverting ureterostomy is done if the injury is immediately recognized. However, if the injury is seen late, nephrostomy, preliminary to definitive corrective procedure, is indicated. In the injuries of the lower third of the ureter, primary anastomosis is carried out if the severance is found early; however, in the late injuries, preliminary nephrostomy is again the procedure of choice, followed later, after tissue reaction has subsided, by a choice of one of several procedures. If a

segment of the pelvic ureter is absent, a tube may be constructed from the bladder which will bridge the defect (Fig. 14), the ureter may be transplanted to the bladder if the proximity of the

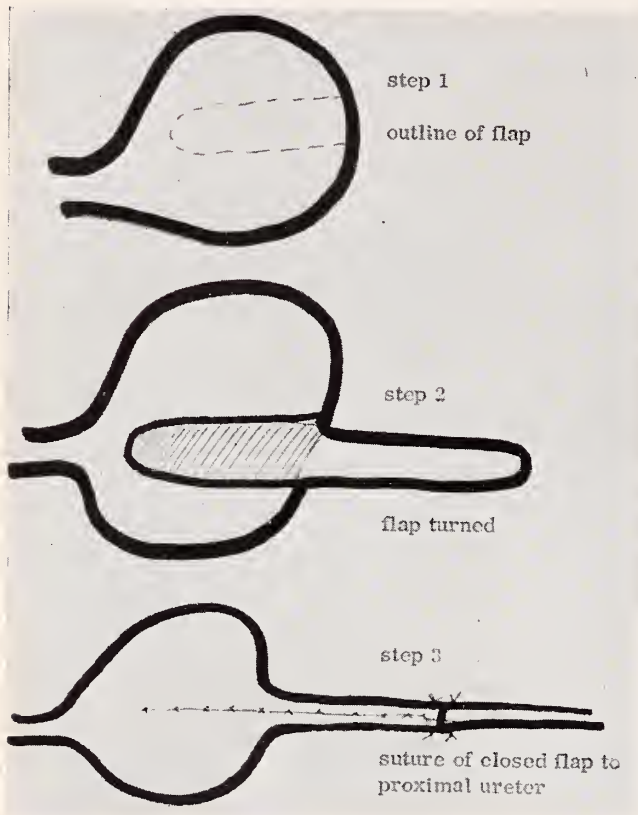


Fig. 14. Diagram illustrating bladder flap operation for bridging of ureteral defect adjacent to bladder.

bladder is such that this procedure can be accomplished without exerting undue tension on the ureter, an isolated ileal loop can be constructed and anastomosed to either end of the ureter, or an ileal pouch may be constructed, but nephrectomy may be the only procedure that can be accomplished in some instances. Ureteral-intestinal anastomosis should be avoided if at all possible; however, the presence of multiple injuries of the bowel may make the use of a transplanted ileal segment feasible. The value of colostomy and adequate diversion of the urinary stream cannot be too vigorously stressed in instances where penetrating wounds involve both bowel and ureter. A diverting and decompressing nephrostomy should be the preliminary step in management of ureteral injuries discovered late, for many times, a reconstruction of the ureter can be accomplished, avoiding nephrectomy. *Many of the surgical injuries to the ureter might well be prevented by preoperative placement of ureteral catheters.*

Injuries of the Bladder

The surgeon's delay and failure to execute prompt and adequate surgery in rupture of the urinary bladder will almost inevitably result in the death of the patient. The wartime surgeon demonstrated by low mortality rates the value of prompt and efficient drainage of the urinary bladder as a necessity in bladder perforation. The bladder, subject to marked variations in its size and shape, and its position as an abdominal organ in the human until approximately the age of twenty, are factors of its susceptibility to injury. The adult bladder is located behind the symphysis pubis in a muscular bed surrounded by the true bony pelvis, anchored distally to the prostate, posteriorly to the seminal vesicles and rectum in the male, and to the cervix and uterus in the female. The anterior fatty and areolar tissue, the space of Retzius with the overlying urachus, and the peritoneum spread well over the dome of the bladder, are important anatomical mechanisms.

As in the kidney, bladder injuries can be classified as either penetrating or nonpenetrating, with the nonpenetrating type being the most common and seen frequently with distortion of the bony pelvis by fracture. The most common nonpenetrating injury is the contusion where damage may be evident only in the serosa, muscle layers, mucous membrane, or all three with the bladder wall remaining intact. This is most commonly seen in the post-partum female, surgery on organs adjacent to the bladder, and with some fractures of the bony pelvis.

The thin distended urinary bladder extending over the symphysis subjected to a sudden blow usually results in an intraperitoneal rupture of the urinary bladder (Fig. 15), for, as the bladder distends, the peritoneal reflection from the anterior abdominal wall to the bladder becomes elevated leaving an extraperitoneal area immediately above the pubis. Continual flow of urine in moderate to large quantities into the peritoneal cavity does not cause peritonitis or serious consequence immediately; however, infected urine introduced into the peritoneum soon produces a violent peritonitis. An occluding effect may occur initially as adjacent omentum and intestine cover the site of the bladder rupture, if the rupture is not too large, producing a temporary partial seal, but this seal becomes ineffective as more urine is secreted from



Fig. 15. Contrast cystogram of classical intraperitoneal rupture of urinary bladder.



Fig. 16. Multiple fractures of the pubic rami producing a large extravascular hematoma and cystogram of intact "tear drop" bladder without rupture.



Fig. 17. Contrast cystogram of combined intraperitoneal and extraperitoneal rupture of urinary bladder.

the kidneys into the bladder, and the rupture again becomes active.

Extraperitoneal rupture occurs in the area of the bladder not covered by peritoneum and is most commonly seen in association with fractures of the bony pelvis below the pelvic brim, particularly the pubic rami and symphysis. The rent is usually made by perforation of bony spicules, but shearing force on the bladder moorings may also produce a tear. All extraperitoneal injuries occur close to the vesical neck on the anterolateral wall of the bladder, and urine extravasates into the space of Retzius and dissects into regions as low as the thighs and as high as the umbilicus. Extravasation of urine has been observed to pass through the greater sciatic notch to the buttocks, the obturator foramen to the thigh, and the inguinal canal to the scrotum as well as extending upward on the abdominal wall. If the urine is infected, the toxic and necrotic action in undrained tissues is fatal; however, sterile urine in a similar situation will produce necrosis and suppuration, but the process is more insidious. Hemorrhage in this area, particularly when secondary to pelvic fracture, can be most severe because of abundant blood supply via the internal pudendal vessels and their branches passing through the urogenital diaphragm, the obturator and superior vesical vessels, the vesical plexus of veins, and the pubic branches of the inferior epigastric artery and obturator artery anastomosing on the posterior surface of the

pubis. Large hematomas develop to distort the shape of the bladder even when bladder rupture is not present and produce, as seen by cystogram, the "tear drop" bladder (Fig. 16).

In perforating injuries, combined intraperitoneal and extraperitoneal rupture (Fig. 17) is usually encountered as the missile passes through the rectum or perineum, and penetrates the intraperitoneal and extraperitoneal areas of the bladder in turn.

The finding of shock and hemorrhage is immediately evident, accompanied by lower abdominal pain, or pain over the pubis, and the patient expresses an extreme desire to void with inability to accomplish the act. Microscopic hematuria, but usually thick blood or clot is found. Pressure applied over the pubic foramen is excruciating, and, classically, compression of the iliac crests simultaneously toward the midline produces severe pain. Bimanual rectal examination reveals a pelvic mass which consists of blood and extravasated urine. The patient seen twenty-four hours or later after an extraperitoneal rupture is feverish and toxic because of the extravasation of urine, and induration and superficial inflammation of the suprapubic area is noted. If there is injury to abdominal viscera and intraperitoneal rupture, there will usually be nausea and vomiting, and, if not, as the extravasation of urine into the peritoneal cavity continues, ileus develops, pain is noted in the epigastrium, chest, or in the shoulder

strap area, and in twenty-four hours there is usually marked distention, vomiting, high fever, and leukocytosis which may mask accurate diagnosis.

If rupture of the bladder is definitely present, surgery must be immediate. The contrast cystogram using 150 to 200 cc.'s of 20 per cent Skiodan with views in the anterior-posterior, oblique, lateral and upright positions provides the only positive diagnosis. Air cystograms, cystoscopy, and the frequently described procedure involving catheterization with injection of measured amounts of fluid into the bladder, and comparing the amount returned, should be forgotten. A urethrogram, to determine the status of the urethra, can be very simply made after the cystogram, by placing a rubber tipped syringe directly into the urethral meatus and injecting the contrast material as the film is being made. Suprapubic cystostomy with careful inspection of the interior of the bladder is completed in the usual manner, utilizing a large four-wing or mushroom type catheter for drainage. If there has been damage to the membranous or prostatic urethra, a splinting catheter should be placed prior to closure. The perivesical and prevesical areas are well drained with numerous Penrose drains.

In intraperitoneal rupture, inspection of the prevesical area prior to opening the peritoneum will show only blood and clots and no urine. The peritoneum should then be opened and the peritoneal cavity thoroughly inspected and cleansed. The tear in the bladder is repaired from the peritoneal side with chronic catgut, and the peritoneum closed without drainage. The bladder is then thoroughly inspected and a cystostomy tube placed. In perineal lacerations of the bladder, the same procedure is followed. However, in penetration of the bladder via the rectum, suprapubic cystostomy is first completed followed by colostomy in order to avoid a vesicorectal fistula. In all instances, failure to remove foreign bodies from the urinary bladder invites formation of bladder calculus, as does the use of silk suture technique for bladder closure.

The complications are many in rupture of the urinary bladder, and particularly so if it is not promptly treated as outlined. A stormy course of peritonitis is usually encountered in intraperitoneal rupture, and this becomes more severe as the time from injury to surgery elapses. Osteomyelitis of the pelvic bones and abscess formation are fre-

quently seen in extraperitoneal rupture and particularly in those that have been poorly drained.

Injuries of the Genital Tract

Injuries of the male genitals are infrequently encountered in civilian practice and present problems of management that require astute judgment as to procedure. The profound shock and hemorrhage of trauma to the deeply placed vital viscera is not seen with genital injuries, but the possibilities of lifelong distress and unhappiness are ever present from mutilations with deformity, testicular injuries with infertility, and penile injuries with defective and painful erections. A post-traumatic urethral stricture may create a wet, miserable, social outcast of a man. General management of genital injuries is fairly well standardized. The causes are many—missiles, knife blades, a well-directed boot, power take-off belts, the sharp edges of the fractured pubic bones, the destructive fall astride a joist, the hideous penetration of impalement, the wounds of war, irradiation reaction, and surgical accidents.

A pair of trousers caught in a tractor take-off, a machine belt from power source, or an unguarded set of gears finds the trousers gone, together with most of the genital skin, one or both testes, and, on rare occasions, the penis itself. If the testes are intact and with adequate blood supply, they must be covered completely after light debridement of the devitalized areolar tissue, removal of all foreign material, and careful cleansing with normal saline. Administration of tetanus toxoid and antibiotics must be routine. With sufficient remaining skin, the scrotum may be reformed in minor injuries and the testes encased in their normal location. A temporary bed for the testes can be made in either thigh or above the pubis for each testicle, if the skin loss is too great. All possible viable skin must be preserved.

The covering of the denuded penile shaft must be done without forming scar contracture, and remaining vital tissues should be carefully preserved and used provided they have a proximal attachment. Skin of the terminal shaft usually remains well attached at the penile corona and should not be used, even if completely viable, unless a broad bridge of uninjured skin extends full length down the shaft and is continuous with the normal skin beyond the area of denudation. A small cuff of normal preputial skin left attached

to the penile shaft, proximal to the corona, will become edematous and an intolerable nuisance. A split thickness graft from the hairless portion of the abdomen or chest is wrapped loosely about the penile shaft with its edges overlapped and sutured in the midline dorsally in a zig-zag fashion to prevent linear contraction of a straight scar. At the base of the penis and at the corona, the edges of the graft are everted and sutured to the adjacent skin, making several cross-cut incisions along the suture line to prevent formation of a constricting band. An indwelling catheter is left in the urethra, and a firm even pressure dressing with an elastic type bandage is applied around the penis. Antibiotic therapy and tetanus toxoid is given, together with large doses of stilbestrol and sedation to decrease or prevent erection.

Punctures, dislocations, contusions, missiles, and the bizarre mutilations of the insane comprise the injuries of the penile body proper. Except in injury of the erect penile body, hemorrhage is rarely massive, and the bleeding can generally be controlled by application of a tourniquet proximal to the protruding ends of two Keith needles placed criss-cross through the penile body. Final permanent control is accomplished by closing the stump of the remaining penis with a continuous suture through Buck's fascia. Subcutaneous hematomas must be promptly drained and the offending vessels ligated, and if the wound is of the penetrating type all foreign material must be removed for, if left in the penile body extensive, fibrosis will occur. Every effort must be made to provide the injured with a properly voiding and normally erect penis, and management should be directed to these objectives. Amputation should not be done except for a well demarcated post-traumatic gangrene. Amputation in the young, as well as in the older male, can be catastrophic to the psyche.

Injuries of the Urethra

Injuries of the urethra are encountered in the use of foreign bodies for sexual gratification of the mentally disturbed, in the use of instruments by the inexperienced or unskilled, and most commonly in the straddle injury and fracture of the bony pelvis. Extraction of the self-introduced foreign body is accomplished easily in most instances by passing an endoscopic sheath into the urethra and with a foreign body forceps in place, grasping and

feeding the object into the sheath and removing the sheath and foreign body as a unit. An indwelling catheter should be placed for a reasonable length of time depending upon the amount of surgical injury and foreign object injury to the urethral mucosa, until all possibility of extravasation of urine is past.

The physician using urethral instruments should be aware of the proper use of the instruments and the consequences that might result from their improper manipulation. Metal catheters should be placed in the rubbish container and only the soft rubber type used. Should a sound or other object used for diagnosis or treatment be pushed through the urethral wall, an attempt should be made to pass a stiletted catheter into the bladder and left indwelling for several days. If this maneuver is unsuccessful, a suprapubic cystotomy should be immediately done to prevent possible extravasation of urine and permit placement of a catheter antegrade per urethrum with cystostomy drainage as well. The use of instruments for dilating urethral strictures should bring to mind the possibility of rupture and extravasation, particularly in the severely strictured male where there is always infection. If rupture is produced, prompt surgical drainage with placement of a urethral catheter must be done to prevent extravasation and formation of a life-taking peri-urethral phlegmon with its gangrenous penile and scrotal skin, profound toxemia, and extravasation to the flanks and abdomen.

In straddle injury of the male urethra, a severe external violent blow to the perineum crushes the thin friable urethra under the edge of the bony arch of the symphysis pubis with such impact that it is commonly severed completely (Fig. 18). The patient may not be aware immediately of his injury, but at the first post-injury voiding he finds little or no urine appearing from the external meatus and the perineum filling with urine. Fortunately, sufficient spasm of the sphincteric mechanism occurs in many individuals, and they are unable to void and are first seen in acute retention. If the lumen remains intact, a catheter may be very easily passed into the urinary bladder and, if this can be accomplished, it should be left indwelling for a minimum of fourteen days.

The most ideal conditions for control of ruptured urethra occur prior to the presence of urinary extravasation. If a catheter is passed to the

point of injury where the urethra has been completely severed and cannot be passed beyond this area, a suprapubic cystostomy must be immediately undertaken to prevent extravasation. At surgery

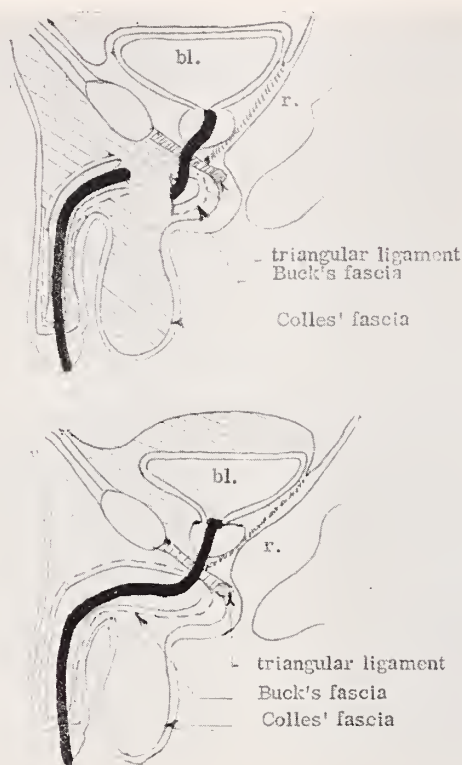


Fig. 18. (above) Diagrammatic representation of rupture of urethra distal to triangular ligament with extravasation of urine to abdominal wall, perineum, shaft of penis, and scrotum.

Fig. 19. (below) Rupture of urethra proximal to triangular ligament with extravasation limited to perivesical area.

an attempt must be made to re-establish the continuity of the urethral lumen, and an indwelling catheter as well as a suprapubic cystostomy tube placed.

When the urethral rupture has already been complicated by urinary extravasation from a straddle injury, the triangular ligament of the perineum, the pelvic bones, and the abdominal wall all attempt to keep the urine outside the body cavity. The extravasation is sharply limited in the perineum and external genitals by the anatomic barrier of the union of Colles fascia with the sheath of the transverse perineal muscle, and the fascia of the inner thighs at the crease of the groin. As time passes, extravasation fills the scrotum and the shaft of the penis and the classic picture is noted. Radical drainage to the abdominal wall,

the perineum, shaft of the penis, and skin of the scrotum is performed by breaking down all of the tissues with the finger and placing too many rather than too few drains. Suprapubic cystostomy must also be done with an attempt to place a catheter per urethrum by introducing interlocking sounds. If the severed ends of the urethra should be identified at the time of perineal drainage, an attempt to unite them is usually futile and, instead, one should rely on the remarkable regenerative activity of the urethral mucosa over an indwelling catheter for two or three weeks to establish continuity of the urethral lumen.

Uncommonly, straddle injury with fracture of the pubic arch may sever the body of the prostate at the triangular ligament (Fig. 19), and, similarly, the patient is unable to void and a catheter is passed with futile attempts to obtain urine. On rectal examination, the prostate can be felt elevated out of its usual position and displaced by a soft mass consisting of blood and urine extending well into the rectum. Signs of urinary extravasation in the perineum and genital region characteristic with urethral rupture external to the triangular ligament are not present, for the extravasation is confined internal to the triangular ligament similar to a rupture of the bladder. Immediate cystostomy with removal of all extravasated blood and urine with breakdown of all septa by the finger and placement of multiple drains is the fundamental procedure. With interlocking sounds, the ends of the severed urethra can be identified and an indwelling bag type catheter placed per urethram, with external traction of at least one pound exerted on the catheter to draw the fractured and dislocated bladder neck into proper position internal to the triangular ligament. To depend on the latex bag to hold the ends in apposition is folly, and several anchoring sutures of heavy catgut should be placed through the prostate and tied in the perineum over small pieces of rubber tubing. The possibility of intraperitoneal injury is very real, and the peritoneal cavity should be explored as well at this time.

The patient should be impressed with the requirement for lifelong postoperative observation in management of urethral injuries, for stricture in the injured area of the urethra is inevitable, requiring repeated serial dilatations and, in many, internal urethrotomy.

Injuries of the Testes

Violent destructive injuries of the testicle occur with scrotal avulsion and gunshot wounds, and concentrated effort must be made to conserve the remaining testicular tissue. Total rupture or severe crushing of the testicle is a morbid problem, occasionally complicated by massive hematoma formation which may mask the extent of the injury. Testicular atrophy usually results even if the blood supply of the testicle is not seriously damaged by virtue of the frailty of the spermatogenic tissues themselves. Pain of testicular injury is intense and profound shock, out of proportion to the degree of hemorrhage, is characteristic. In non-penetrating injury with moderate hematoma formation, bedrest, adequate scrotal support, ice packing, antibiotics, tetanus toxoid, and sedation are usually all that is required. A similar regimen is used in the penetrating injuries, provided there is no foreign body present and hemorrhage is minimal. Penetrating or nonpenetrating testicular injuries with massive scrotal hemorrhage must be explored to evacuate clots, control the bleeding, and suture the testicular tunics if it is felt that the testicle is viable. In bilateral injury, if one testicle is totally lost every effort should be made to save the testicle with the lesser injury, no matter how badly damaged it may appear. In mumps orchitis, androgenic activity of the atrophic testicle remains, but with the atrophy of injury, replacement therapy of synthesized male hormone, testosterone, must be given as a sublingual tablet or implanted subcutaneously in pellet form every two to three months to prevent hypogonadism. Torsion of the cord of the injured testicle can be prevented by single suture fixation of the testicle to the scrotum, at the time of surgery. Postoperative hematoma formation with its practically limit-

less extension into the loose aerolar tissue of the scrotum can be prevented by extremely meticulous ligation of all bleeding areas. A compressive dressing with continuous ice pack, in addition to precise hemostasis, will prevent hematoma formation, but if hemorrhage and swelling continues, the scrotum must be reopened and all blood clots removed and hemostasis secured.

Summary

The various causes and types of genito-urinary tract injury and treatment of these injuries is discussed.

Awareness of the possibility of damage to the urinary tract is the most important factor in the patient with multiple injuries or in the patient subjected to radical pelvic or abdominal surgery.

A careful history and physical examination, coupled with appropriate laboratory and radiographic studies, will make the proper diagnosis and direct the treatment necessary.

Damage to other organs frequently accompanies trauma to the urinary tract, and may require priority of surgical management.

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POST-TONSILLECTOMY MORBIDITY

The value of a new antibiotic-analgesic chewing troche on the postoperative course in tonsillectomy in sixty-four patients was recently assessed. The new preparation (Orabiotic®) is a chewing gum troche containing 3.5 mg. neomycin, as the sulfate; 0.25 mg. gramicidin, and 2.0 mg. propesin.

Operative procedure was by the snare technique following dissection. Sutures were used only when bleeding could not be controlled by direct pressure with sponges. Patients were asked to chew one of the new troches for ten to fifteen minutes at four-hour intervals for five days after surgery.

There were manifest subjective, if not entirely objective, benefits attributable to the medication. The medication acted like a "bacteriostatic bath" over the

oropharyngeal membranes and the muscular exercise and increased salivation initiated by the chewing and swallowing was of value in minimizing and shortening post-tonsillectomy morbidity. There was only one instance of secondary hemorrhage in the patients receiving the troche. The tonsillar fossae appeared unusually clean and showed only minimal inflammation.

Soreness of the throat and pain on swallowing were invariably lessened and patients returned to regular diets rapidly. Reflex otalgia occurred in only two of the patients treated and was so mild that it required no medication. In none of the patients was there a reaction, either systematically or locally. Tolerance and acceptance of the preparation were excellent.—GRANBERRY, C., and BEATROUS, W. P.: *E.E.N. & T. Mo.*, 36:294, 1957.

Chorionepithelioma

Report of a Case with Spontaneous Intra-abdominal Hemorrhage

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CHORIONEPITHELIOMA is the term applied to the most rapidly fatal malignant tumor encountered in medicine. It is also a tumor of exceptional rarity and of bizarre manifestations.

Three cases described by Chiari in 1877 as carcinoma of the uterine fundus have since been classified as chorionepithelioma and stand as the first reported cases. Additional cases were reported by Sanger in 1893 and by Marchand in 1895. According to Williams, Marchand identified protoplasmic masses with the syncytium, and the individual cells with those of Langhans' layer. Maintaining that the tumor was epithelial in origin, he proposed the term chorionepithelioma.

This tumor occurs in females in the child-bearing period, rarely after the menopause, more rarely in virgins, and in teratomas of the testis. It develops during or after a full term pregnancy, after an abortion, and in cases of hydatidiform mole.

The ages of those affected range from seventeen to fifty-eight years with 67 per cent of cases occurring between the ages of twenty and forty years. In the fifteen cases reviewed by Dilworth and his co-workers the average age was 25.8 years. The incidence is said to increase with the number of pregnancies; Voegelin found an incidence of one case in 13,850 pregnancies; Hepp found one case in 59,300 deliveries. Hydatidiform mole has an incidence of one in 2,500 pregnancies. In St. Luke's Hospital in Duluth in eleven years there were 12,722 deliveries, eight moles and one chorionepithelioma. At St. Joseph's Hospital in Milwaukee there were 24,951 deliveries between 1937-1947; there were fifteen moles and one chorionepithelioma. It is said that this tumor is so rare that a case has not been seen in many large medical institutions.

As stated previously, chorionepithelioma may make its appearance during pregnancy or there may be a latent period of as long as seven years,

as in a case reported by Willeford and Rigdon. Novak believes that chorionepithelioma occurs in only about 1 per cent of moles and that radical treatment of moles is not warranted.

The primary tumor is usually located in the uterus, but cases have been reported in which it has arisen outside the uterus, in the cervix, fallopian tube or a teratoma. Grossly, the tumor may be small and insignificant in appearance. Metastasis may occur to the labia, lungs, diaphragm, liver, spleen, kidneys, brain, mediastinum, thyroid, bone, bladder, urethra and lymph nodes. In fifty-two cases collected by Dorland, metastasis to the lungs were present in 78.38 per cent, to the vagina in 54 per cent, to the kidneys, spleen and ovary in 13.5 per cent, to the liver, broad ligament and pelvis in 10.8 per cent, and to the brain in 5.4 per cent of the cases.

Symptoms usually appear one to four months after labor. The most common symptom is hemorrhage which is said to be present in 90 per cent of cases. It may be "sudden, severe, depleting" and may be secondary to a metastasis, as vaginal, pulmonary or cerebral. Intra-abdominal hemorrhage from perforation of the uterine wall or rupture of a metastasis may be present. Cough or bloody sputum may result from a pulmonary metastasis. In two previously reported cases death was from rupture of the liver at the site of a metastasis.

Nodules may appear in a labium or in the vagina, or the early signs may resemble those of retained placenta, sepsis and subinvolution with abdominal pain, chills and fever. "Bluish nodules in the vagina or vulva which ulcerate should arouse suspicion." In one case enlargement of the liver was the main feature; the original tumor was not found and visceral metastasis were confined to the liver and broad ligament. In another instance bleeding from the bowel resulted from an implant in the jejunum.

As in other conditions, diagnosis must be based upon an evaluation of the clinical manifestations, dilatation and curettage, or biopsy and biologic tests. Persistent bleeding after delivery should arouse suspicion. Curettage frequently fails to provide tumor tissue and therefore does not establish the diagnosis.

Biologic tests for the determination of gonadotropin in the urine are employed in the diagnosis of mole and chorionepithelioma. They are based upon the fact that living trophoblast produces a gonadotropic principle which appears in the maternal blood and urine and, since trophoblast is abundant in both mole and chorionepithelioma, gonadotropin is produced in great quantities. Picard states that in the presence of chorionepithelioma prolan excretion is 10 to 500 times that observed in normal pregnancy. When the Asheim-Zondek or Friedman test is positive some weeks after termination of pregnancy, either full term or abortion, one should suspect mole or chorionepithelioma. The frog test is advocated by Wenger because it is inexpensive, information can be obtained in four hours, and the test is said to be accurate.

One should be aware that the biologic tests are valuable aids but not infallible. After the evacuation of a mole, an Asheim Zondek or Friedman test should be made frequently, according to Jordan. Quantitative titration should be done when a positive test is obtained. An increasing titer causes one to suspect chorionepithelioma.

Treatment of chorionepithelioma is unsatisfactory and the prognosis is poor. If the diagnosis is made while the tumor is confined to the uterus, panhysterectomy is indicated. Roentgen therapy is used and a few authors have reported good results. In advanced cases a fatal outcome can be anticipated regardless of the therapy employed. In sixty cases reported by Park and Lees the mean interval between termination of pregnancy and death was 6.1 months.

Case Report

A married woman, aged twenty-six years, consulted Dr. R. A. Demo on March 20, 1953. She stated that she had not felt good since the birth of her baby a month previously. A severe backache was her main complaint. The pregnancy had been entirely normal and the delivery spontaneous and uneventful. The patient had been confined elsewhere. It was learned that she had had two miscarriages followed by two normal pregnancies.

On examination the patient was found to be well developed, well nourished and in no acute distress. There were a few moist rales at the pulmonary bases. The heart beat was regular. Blood pressure was systolic 110, diastolic 50 mm of mercury. The abdomen was flat and soft; above the umbilicus and slightly to the right there was a mass 5-6 centimeters in diameter which was tender and slightly movable. The entire abdomen was a trifle tender.

On the left wall of the vagina there was a large polypoid mass which was bluish in color and appeared necrotic. On the cervix there was an ulcerated area which, when scraped, bled profusely. It was necessary to clamp the cervix with a ring forceps in order to stop the hemorrhage. The patient was sent to the hospital by ambulance.

In the operating room, under sodium pentothal-oxygen anesthesia, the bleeding area on the cervix was sutured, the polypoid mass was removed from the wall of the vagina and some necrotic appearing material was removed from the uterine cavity. This procedure was carried out by Dr. Demo.

On the following day the hemoglobin was 5.1 gm. One thousand cubic centimeters of blood were administered. On March 22 the patient complained of sudden severe pain in the abdomen and dyspnea. On examination she was found to be in severe shock. She was pale, the pulse was rapid and thready, the blood pressure 44/10. The abdomen was full and everywhere tender. The small mass in the right upper quadrant was again felt. There was dullness in the flanks and a fluid wave was elicited. It was obvious that there was intra-abdominal bleeding. Blood and intravenous fluids were started and the patient taken to the operating room.

Under pentothal-gas-oxygen-ether anesthesia a low mid-line incision was made. The peritoneal cavity was filled with blood, some of which was old and clotted. The uterus was possibly a little soft, but otherwise the pelvic organs were normal. The liver was entirely nodular and there were large nodules on the edge of the liver. These nodules were rather black and reminded one of melanoma. One of the nodules on the posterior inferior surface of the liver was bleeding actively. A biopsy was taken, then gelfoam and sutures were used to arrest the bleeding. The wound was closed.

In spite of the use of numerous transfusions, intravenous fluids and other supportive measures, the patient's condition gradually deteriorated and she expired on March 25, three days following the operation.

Both surgical and autopsy material was examined by Dr. R. W. Koucky who submitted the following, very excellent, description:

"The specimen consists of the uterus and its adnexae, liver and all of the structures of the thorax. The heart weighs 390 grams. There are no tumor implants. The valves show no evidence of endocarditis. The coronaries are soft and large. The left lung weighs 305 grams and the right 310. Both lungs are riddled with innumerable tumor implants, generally about 1.5 cm. and ranging to about 2.5 cm. in diameter. The tumors are reddish

with occasional grey mottling. The lung parenchyma shows no significant change. The hilus of each lung shows tumor masses up to 3 x 4.5 cm. The liver weighs 3,020 grams and contains multitudes of tumor masses. Some of these are up to 6 cm. in size. Many appear within the hepatic veins. The tumors are markedly hemorrhagic and many are very soft, apparently due to necrosis. The surface of the liver is nodular due to these masses and several of these projecting tumors show defects due to rupture or surgery. The uterus is slightly enlarged. In the fundus and to one side there is a circular knob projecting into the cavity. The knob measures 3.5 cm. in diameter and is approximately the same height. It is made up of firm material resembling old blood clots. The material breaks off from the muscle so easily that it is difficult to keep the two together for purposes of section. When the material is removed, the uterine musculature appears intact and not infiltrated. The cervix and vault of the vagina show three areas of ulceration up to 1 x 1.5 cm. One of these shows the sutures of the recent cervical biopsy. The substance of the cervix and vaginal wall is thickened and discolored by hemorrhagic tumor tissue. In its thickest portion this tumor is about 12 mm. The surface of the uterus shows no tumor. The tubes are negative. The ovaries show essentially no change. Many of the follicles are 4 to 5 mm. in size. The multiple corpora lutei often seen with a mole or a chorionepithelioma are not present.

The sections taken from the uterine wall at the base of the hemorrhagic mass show an infiltration of malignant tissue. The cells show extreme variation in size and form and obviously are very rapidly growing. However there are definite evidences of a chorionepithelioma. The cells frequently coalesce to form masses of syncytium. The presence of tumor tissue in the uterine wall and the presence of these syncytial masses positively identifies the tumor as a chorionepithelioma. Study of the deep parts of the uterine wall shows that many of the large veins are filled with tumor tissue. The lesions in the cervix show the same type of tumor and unquestionably the cervical tumor is an implant from the uterus. Sections of lung and liver show the same type of tumor. The tumor in these positions is very much distorted by hemorrhage. Even tiny foci of tumor tissue are surrounded by a relatively large amount of blood and coagulated serum. In some of the masses within the lung the focus of tumor tissue is extremely small. Study of the blood vessels in both the lung and the liver show tumor emboli."

Diagnosis.—Chorionepithelioma.

Summary

1. Chorionepithelioma is a rare, extremely malignant tumor of trophoblastic origin.

2. It usually occurs in females in the child-bearing period, but may occur in virginal and postmenopausal women, and in teratomas.

3. It develops during or after a full term preg-

nancy, after an abortion, and in cases of hydatidiform mole.

4. Hemorrhage is the most common symptom. This may be secondary to a metastasis.

5. A case is reported in which there was widespread metastasis one month after a normal delivery and fatal intra-abdominal hemorrhage from a metastasis in the liver.

Acknowledgment

I am indebted to Dr. R. A. Demo for the privilege of seeing this patient and to Dr. R. W. Koucky for examination of the tissues.

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Factors Involved in Screening Patients for Gastric Cancer

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THE SURVIVAL figures from the best clinics for patients with gastric cancer are still regrettably low. The current nihilistic approach, attempting to show that patients suffering from gastric cancer are predestined to either death or survival at the time their lesion first begins to grow, will gain us nothing toward ultimate improvement of our present situation. If we must wait for the biologically slow-growing cancer to manifest itself, and operate to cure patients only when the disease has been present for a matter of months without taking the life of the cancer victim, we will virtually condemn to death a major portion of those people whom (by virtue of present knowledge) we know could be saved by radical surgical therapy.

Undoubtedly, some authors have the weight of statistical study on their side when they demonstrate that the survivorship from gastric cancer is often better in those patients harboring symptoms for the longest period of time prior to treatment. However, if we are going to provide any possibility for cure to those unfortunate victims (now numbering between 85 and 90 per cent of all gastric cancer patients) who die within a matter of months following the diagnosis of their disease, we must accept the challenge of providing surgical therapy to the patient who has an asymptomatic, but malignant, gastric condition.

Immediately it becomes apparent that *whole-sale examination* of the entire population on an annual basis is impossible; however, *adequate screening* of the population to indicate those people with an increased likelihood for the development of gastric cancer is mandatory.

Physiological Factors of Importance

The association between gastric anacidity, gas-

tric mucosal atrophy, and gastric cancer has long been known. Only during recent decades, however, has a vigorous attempt been made to utilize these readily detectable factors in the screening of possible gastric cancer victims. Recent studies at the University of Minnesota Hospitals indicate that 80 per cent of patients with gastric cancer have complete achlorhydria following triple histamine stimulation of the gastric mucosa. The same studies indicate that cancer patients other than those suffering from stomach cancer have only a 30 per cent incidence of achlorhydria; non cancer patients in a similar age group of fifty years or older likewise have only a 30 per cent incidence of achlorhydria. In the Cancer Detection Research Center at the University of Minnesota, 25 per cent of the 7,786 people examined as of June 30, 1956, were found to be achlorhydric. This association has been utilized as a screening device in the Cancer Detection Research Center for the past eight years. We believe the results of this study indicate the possibility for great improvement in the survivals from gastric cancer on a large-scale basis with wider application of these methods.^{8,9}

All examinees at the Detection Research Center have had a gastric secretory analysis performed on gastric juice obtained by the passage of a Levine tube. The standard sodium hydroxide, Toepfer's reagent, determination has been performed. The gastric mucosa is stimulated with one hypodermic injection of 0.5 mgms. of histamine diphosphate. Twenty-five per cent of our examinees have been either achlorhydric or severely hypochlorhydric (less than 30 degrees free acid) by this method. These people receive routinely each year a gastrointestinal x-ray study, and in those instances where polyps of the stomach are suspected, or known to exist, an air contrast gastrointestinal study is performed.

Since only 25 per cent of persons over fifty years of age are achlorhydric or hypochlorhydric (as found in our own experience), and since over 80 per cent of all gastric cancers occur over

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GASTRIC CANCER—HITCHCOCK

TABLE I. GASTRIC CANCERS IN CANCER DETECTION CENTER PATIENTS

March 1, 1948 to June 30, 1956

	Asymptomatic	Symptomatic
Achlorhydric	10 (1 normal—1 year)	11*
Total number	10 (1 carcinoid)	11
Alive and well	5 (50%) (36 months mean)	1 (9%) (18 months)
Positive lymph nodes	3 (30%)	10 (91%)
Local extension	1 (10%)	10 (91%)

*Four were achlorhydric with normal gastro-intestinal series. Re-fused to follow suggestions for re-examinations.

Developed gastric cancers—24, 50, 63 and 64 months later. Three dead.

the age of fifty years, we have limited the group to be tested periodically to those over fifty years of age who have achlorhydria or hypochlorhydria. These two filters enable us to reduce that segment of our population requiring repeated gastric roentgenograms to one-fourth of the group of persons over fifty years of age, or approximately 6.5 per cent of the over-all population.

In Table I we note that the total gastric cancer experience in the 7,786 men and women is twenty-one cancers. Of this group, ten were completely without symptoms at the time the diagnosis was established by x-ray examination, and have been placed in the asymptomatic group. Eleven patients either had symptoms at the time of discovery of their cancer, or were alerted to the necessity of annual x-ray examinations and, failing to follow the recommendations of the Center, developed symptoms of advanced gastric cancer. In this latter category, there were four patients who developed gastric cancers twenty-four, fifty, sixty-three, and sixty-four months after their first normal gastric x-rays performed at the Cancer Detection Center.

In the asymptomatic group there was one patient who might have been delayed in his surgery because of one annual gastric analysis revealing a normochlorhydric stomach, whereas examination the preceding year and the year following indicated a stomach that was definitely achlorhydric. Of the 75 per cent of the Cancer Detection Center patients who were normal as far as gastric secretion is concerned, there has been no indication of a gastric cancer developing during this eight-year-and-three-month-period of follow-up. The completeness of our annual contact with all examinees at the Detection Center makes this fact valid.

In the asymptomatic group of patients there were three (30 per cent) who had positive lymph

TABLE II. CANCER DETECTION CENTER: GASTRIC CANCERS

March 1, 1948 to June 30, 1956

X-Ray Reports	Number	Cancers Actually Found
Probably carcinoma	14	14
Gastric ulcer	28	0
Suspicious area	11	0
Gastric polyps	41 (patients)	4 (10%)
Epigastric mass	3	0
Defect distal esophagus	1	1
Enlarged gastric folds	3	0
Intra-mural lesion	7	1 (carcinoid)
Large luminal mass	2	1 (carcinoma)
		1 (lymphosarcoma)
	110	22 malignancies

nodes at surgery as contrasted with ten (91 per cent) in the symptomatic group. Local extension of the cancer beyond the stomach was found in only one patient out of ten in the asymptomatic group, and is to be contrasted with local extension found in ten out of eleven (91 per cent) in the group with frank symptoms at the time of diagnosis. Five of the asymptomatic patients (50 per cent) are living and well, for a mean survival of thirty-six months. Only one of the patients with symptoms at the time of diagnosis is living at this time, representing a 9 per cent survival.

Analysis of Patients with an Abnormal Finding by Gastric X-Ray

In Table II are listed the conclusions from the roentgenologists as they have examined the patients in the Cancer Detection Research Center with gastrointestinal x-ray. There were 110 people (1.4 per cent of the total; 5.6 per cent of the achlorhydric-hypochlorhydric group) who had a significant lesion noted during x-ray examination. There were twenty-two malignancies found in this group, or 20 per cent of the patients with a positive gastrointestinal x-ray series. It is of interest that the roentgenologists were correct 100 per cent of the time when they diagnosed a lesion as a probable carcinoma; similarly, in those instances where a frank diagnosis of gastric ulcer was made, there were no cancers subsequently proved. Among the forty-one patients who have had a diagnosis of gastric polyps made on x-ray findings and confirmed by gastroscopic examination or surgery, four carcinomas have been found, for a total of 10 per cent. This figure compares closely with the incidence of malignancy in gastric polyps as previously published from the University of Minnesota Hospitals (11 per cent). Of the seven asympto-

TABLE III.
INCIDENCE OF CANCER IN C.D.C. EXAMINEES
March 1, 1948 to June 30, 1956. (7,786 people)

Over-all incidence of cancer (all types)	3.1%—1 in 33
Incidence of gastric cancers	0.28%—1 in 357
Patients with positive gastric X-rays	110
Malignancies found in this group	22—20%

matic patients reported to have an intramural lesion by x-ray, one has been found to have a carcinoid of the stomach. There was one patient with a lymphosarcoma diagnosed as a large gastric luminal mass and this patient is doing well several years following surgery.

From Table III it is apparent that one person out of each 357 persons examined in the Cancer Detection Research Center had a gastric cancer. To date one person out of each thirty-three examined has had a malignancy of one kind or other.

Comparison of Gastric Cancer Incidence

In previous publications we demonstrated an increase of gastric cancer in persons over fifty years of age with achlorhydria and hypochlorhydria of 4.5 times over the expected incidence per unit of population over the age of fifty per year. In the group of patients with pernicious anemia from the gastric cancer precursor study at the University of Minnesota, we have found a 21.3 times greater incidence of gastric cancer than in the similar sample of the population as indicated above. The total increase for both of these groups has been found to be 4.9 times the expected incidence for the general population over fifty years of age. Therefore, it is safe to say that, as a group, the people who are either achlorhydric or hypochlorhydric, or who are suffering from pernicious anemia, have a 490 per cent greater chance of developing gastric cancer than normochlorhydric persons in the population over age fifty.⁸

Pernicious Anemia

The two common denominators that have been demonstrated for patients with pernicious anemia, achlorhydria, and carcinoma of the stomach, have been the absence of free hydrochloric acid and the atrophic gastritis which accompanies this physiologic disturbance. That the patient with pernicious anemia has the predisposition for the development of gastric cancer in the highest degree

yet known cannot be denied. Our recent studies have indicated a 21.3 times greater chance for the development of gastric cancer in the patient with pernicious anemia as against persons with normal gastric function in the population over fifty years of age. We have never been able to prove any difference in the gastric cancer developing in the patient with pernicious anemia as against the patient with achlorhydria. Recent studies have demonstrated, however, that a portion of the people in the achlorhydric group actually are in a preclinical stage of pernicious anemia. This group of people (6 per cent of all achlorhydric) respond to the Schilling test (utilizing radioactive Vitamin B₁₂ cobalt 60) in a manner similar to the patient with frank pernicious anemia. It is entirely possible that the wider application of the Schilling test to the achlorhydric group of people may focus our attention on an even more limited number of people with a significantly greater potential for the development of gastric cancer.^{10,11,14}

Summary

The regrettably high mortality from gastric cancer as we know the problem today indicates the need for further efforts to better control this serious malignancy. Current methods of patient screening and stomach examination could effect an over-all improvement in the gastric cancer picture. There have been 50 per cent of the *asymptomatic* gastric cancer patients surviving for a mean of thirty-six months, as against 9 per cent in the group of patients in the Detection Research Center with frank symptoms at the time of diagnosis.

The serious economic problem involved with mass x-ray screening of large groups of people has been partially met in a satisfactory manner by limiting our efforts in gastric cancer screening to those persons over fifty years of age, and to those who are either achlorhydric or hypochlorhydric. The feasibility of this limitation has been well demonstrated. From our studies it would appear that a rational program of examination would be as follows: Gastrointestinal roentgenograms every six months for the patients with pernicious anemia; gastrointestinal roentgenograms every nine to twelve months for the persons with achlorhydria or hypochlorhydria. The present failure of all forms of specific cancer tests to permit adequate population screening imposes a grave burden of

responsibility upon those who would deny to their fellow men the possibilities of improving their chances for surviving a gastric malignancy by application of the best known methods of our time.

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THE MANAGEMENT OF NODULAR GOITER

(Continued from Page 387)

Conclusions

Goiters causing symptoms will be treated. Asymptomatic nodular goiters may not be. Nevertheless, the hazards of carcinoma, hyperthyroidism and pressure on contiguous structures are real in nodular goiter. Therefore, with the risk of prophylactic thyroidal surgery practically zero and with surgical morbidity at a minimum, there is justification in recommending thyroidectomy for the majority of patients who have nodular goiter and who are otherwise in good health.

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Some Neglected Practical Points in Allergy

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ANY FIELD of medicine where knowledge is incomplete and results are poor is frequently either completely ignored as being too difficult to master or is casually dismissed as being of no importance. Such is too often the case with allergy. This paper enumerates some practical points which are frequently neglected in dealing with allergic patients.

The diagnosis of allergic disease is made by history, physical examination, and special allergic tests. The history should include a general history, plus a detailed allergic history. A special allergic history form, as suggested by Glaser,¹ will prevent omitting many important facts. Of utmost importance is allowing adequate time to get the patient's complete story. The history is by far the most important tool of the allergist. For example, food allergy is suspected when there is a history of sneezing several times before breakfast, when there is a story of an itching nose or palate, when there is occurrence of fatigue which is not otherwise explained by physical examination, or when there is a history of profuse perspiration in infants associated with feeding. While these conditions can be caused by factors other than allergy, its consideration in the differential diagnosis is often rewarding.

It is almost superfluous to say that an adequate physical examination is necessary for good allergic care. It is most embarrassing to do skin tests for asthma, only to find that the wheezing is due to a foreign body in the lung.

Finally, special allergic tests are used in the diagnosis, of which the most generally useful are skin tests. Skin tests for inhalants correlated with the history are quite reliable, but skin tests for foods are notoriously misleading. Rinkel² repeated skin tests for fourteen common foods ten times in twenty-five patients. He found that 29.1 per cent of negative tests, 26.5 per cent of positive tests and 34.1 per cent of variable tests were associated with clinically demonstrable food allergies. In another

series of 4,264 positive skin reactions obtained from 200 tests on each patient, there were only 567 associated with a positive clinical reaction. Skin reactions not associated with clinical sensitivity are one of the most confusing facets of allergy. How can we best solve this problem? One of the most reliable is by individual feeding tests.

In order to understand the method, it is necessary to understand two points. First is the cyclic theory of food allergy²; that is, in 80 to 90 per cent of cases the symptomatology is related to the frequency of use; as a corollary, if a food is omitted from a diet for a period of months we tend to acquire a tolerance for this food. Second, Rinkel² introduced the concept of masking, i.e., "masking is a temporary decrease or abolition of symptoms following ingestion of a food to which the patient is specifically sensitive." This phenomenon will be seen only when a patient repeats a food in the diet during the time symptoms persist from a previous feeding of the allergic food. This is a clinical facet of allergy and does not occur with every sensitization, but it is a common reason for the patient failing to incriminate a food which is frequently eaten as a cause of symptoms. From a practical standpoint, if a food is omitted from the diet for four days, masking will not be seen. Therefore, in feeding tests, we omit the food to be tested for four days and feed it at noon of the fifth day. A base line of expected symptoms is arrived at by observing the patient at rest for thirty minutes before the food is eaten. Then an average helping of food is eaten and any increase in symptoms is noted for one hour. If there is no increase of symptoms at the end of one hour, a half portion is fed and the patient is observed an additional thirty minutes. As a rule, the number of sneezes, coughs and times the nose must be blown are counted. In addition, the patient's pulse is counted and the occurrence of pruritus, headache or fatigue is noted. This method determines food sensitivities, by positive findings, rather than by the negative findings of the expected relief from removal of the food. In the case of eczema, if we

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remove a positive food from the diet, the skin will not clear for about three weeks, but with a feeding test, we note an increase in pruritus within an hour. In order to avoid masking of food, it is necessary that we educate our patient as to unsuspected sources of common food antigens. We customarily supply our patients with lists of food which contain wheat, eggs, milk or corn. Obviously, we do individual food tests only on common foods, not those rarely used, such as caviar and cardamon.

Food allergy may be perennial, that is, unrelated to other environmental factors. It may be concomitant, as for example, the patient who gets symptoms only when he eats a food during the ragweed season. It may be thermal, as for example, the patient who gets symptoms from corn only when there is a sudden drop in temperature. Obviously, individual food tests may fail to disclose a concomitant or thermal allergen, if they are done at a time in which the concomitant allergen or thermal factor is not operating. In addition, certain foods may be cumulative reactors. As for example, the man who can eat eggs every five days, but will get symptoms if they are eaten daily for several days.

In short, if we treat our patient merely on the basis of positive skin tests for foods, our results will be very disappointing. However, if we base our treatment on foods incriminated by actual feeding tests, we will often achieve gratifying results.

With this background, we can discuss therapy. All allergic therapy can be grouped under three categories: avoidance of the offending allergen, hyposensitization when avoidance is impossible, and symptomatic therapy, which includes steroid therapy.

Foods are a common cause of symptoms in infancy. They may cause skin eruptions such as eczema, coughing, or nasal blocking. Diagnosis and treatment are largely worked out simultaneously. Colic is sometimes caused by cow's milk; but it is not the sole or even a frequent cause of this syndrome. A four-day trial of a milk substitute, such as soy bean milk or meat base milk, will suffice for the diagnosis. Another common pediatric problem is recurrent diarrhea. Most physicians are familiar with the fact that the gluten fraction of wheat has been implicated as the cause of the celiac symptoms, but other foods may cause recurrent diarrheas, especially in the

child under three years of age. I can recall one patient with "so-called" celiac disease who had been relieved perfectly on a diet of skim boiled milk, cottage cheese, banana and lean meat. Later on, he had a return of symptoms which were due to an allergy he had developed to banana. His symptoms were completely relieved when banana was omitted from the diet.

Another common syndrome, which may be relieved by avoidance (relative) of the offending allergen, is the common house dust allergy. This is suspected in a child who develops a cold and cough when the house is closed up in the fall and the heat is turned on. These symptoms persist until the heating season is over. Many of these children will show a so called "allergic salute," made by pressing the palm of the hand against the columella of the nose. This gesture serves temporarily to enlarge the nares. Characteristically, this person will report that his nose is better when he is outside the house. On examination the nasal mucosa will be found to be bluish gray, the turbinates boggy, and an excess of eosinophils may be found when the secretion is stained by Hansel's stain. Relief may often be obtained by environmental control of dust. All feathers should be kept out of the room twenty-four hours a day. The dust in the bedroom should be kept at a minimum by having bare or linoleum covered floors, avoiding dry sweeping, dusting the moldings, taking the bed apart and dusting it, washing the curtains at frequent intervals, and keeping the patient out of the room while this dusting is being carried on. Anti-dust preparations may be of some value. In the more severe cases, hyposensitization may be necessary, but it is surprising how many chronic coughs and running noses can be controlled by such a regime.

The so-called asthmatic or spasmodic bronchitis is a condition commonly encountered in pediatric practice in children under ten years of age. Such patients develop high fever and, on physical examination, expiratory sibilant rales are heard which are indistinguishable from a typical asthmatic attack. X-ray examination of the lungs will frequently be interpreted as showing bronchopneumonia. With this syndrome, there is almost always a family history of allergy. These children will respond to antibiotics and anti-asthmatics such as ephinephrine or ephedrine. With advancing years, a certain number will develop true asthma.

While they respond to antibiotics, their requirement can be greatly lessened by proper allergic management. This includes avoidance of house dust, hyposensitization to house dust, if necessary, and avoiding foods to which the patient is sensitive. If the attack is due to infection, the child will become ill and develop fever within twenty-four hours of the onset; if it is allergic in origin, characteristically he will have three to four days of runny nose and cough without fever before the febrile response appears. This is the symptom complex which can be prevented by allergic management.

In the management of the acute attack of asthma the drug of choice is still epinephrine. This can be best given in small doses of 3 minims every twenty minutes until the patient gets relief or until signs of toxicity, such as tremors, appear. Aminophyllin suppositories are quite valuable in the management of the milder episodes of asthma; however, it is easy to use an overdose of this drug. It has been my custom to advise the mothers to cut the infant size suppository in half and use it every four to six hours in treating a child five years of age or under. If relief is not obtained with one or two doses of aminophyllin by rectum, it is well to have recourse to epinephrine. The child who is vomiting and dehydrated with asthma needs extra fluids and should have parenteral fluid therapy in a hospital. Saturated solution of potassium iodide, one drop per year of age, given three to four times a day, is one of the most valuable remedies for chronic asthma or for the allergic cough which is often associated with asthma.

Finally, may I add a personal plea against the indiscriminate use of steroid therapy for allergic disorders. While deaths from asthma do occur, they were certainly rare before the advent of steroid therapy. At the present time, it is rare for a person interested in allergy to have a patient referred (especially one with asthma) who has not been started on steroid therapy. The reason given is always the same, that it was an emergency. The majority of patients can still be controlled by epinephrine, oxygen, hyposensitization and avoidance of offending allergens. The steroids are only symptomatic therapy, and should not be used in place of an adequate allergic program.

Some practical points in the management of eczema follow. First, in using any new ointment on an allergic patient, as suggested by Glaser,¹ it

is well to do a "use test." That is, make sure the ointment itself will not cause a dermatitis, by using it on a small area for twenty-four hours before applying it generously. Next, when applying ointment to an area such as the popliteal or antecubital spaces, a much greater degree of improvement can be obtained by bandaging. As suggested by Hill,⁵ this is best done by using a clean cotton cloth held in place by an elastic bandage. While restraints are sometimes necessary in handling severe eczemas, the majority can be prevented from traumatizing their skin by the use of arm splints and bandaging. There is considerable debate as to whether eczema is allergic, and whether it should be treated by allergic management or the use of topical remedies. If one rules out seborrheic dermatitis, the majority will do best with local therapy plus adequate allergic control.

As to prophylaxis, children with eczema or skin infection should not be vaccinated against smallpox. Their siblings should not be vaccinated against smallpox until such a time as the eczematous infants can be separated from their non-allergic siblings, during the entire course of the vaccination. As you know, a generalized vaccinia may result in serious or even fatal complications. Other immunizations, including Salk vaccine, may be given with very little more risk than to non-allergic child. It is mandatory that allergic individuals be immunized against tetanus, so that there is no necessity of using horse serum for tetanus prophylaxis.

The most challenging and rewarding field for those of us who care for children is the prophylaxis of allergic disorders. We can not change the constitution of an allergic person, but we can prevent the development of food sensitivity. Breast feeding will prevent the development of milk allergy in the newborn period, but unfortunately, it seems to be less and less popular in our present day society. If there is a distinct likelihood of major allergic difficulties in the infant, and breast milk is not available, milk allergy may be prevented by the use of milk substitutes prophylactically as suggested by Glaser.¹ Certain foods have a greater allergic potential in the infant, but seem to be better tolerated in the older child. For this reason, eggs in any form should be omitted until eight to twelve months of age. Orange juice is not necessary as a source of vitamin C, as it can be readily

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Mediastinal Emphysema

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EARLY in the summer of 1952, one of my internist colleagues and I were attending a meeting of the College of Chest Physicians. Upon my return to my home, I found my older son, who was abnormally healthy on my departure, confined to his bed. His experience drew my attention forcefully to the often unrecognized condition which I am discussing. I would like to recount a brief history of the illness to introduce my topic.

On Friday, June 6, 1952, this eighteen-year-old, exceptionally well-developed male, spent the major portion of the day water skiing. As is usual in that sport, he took several heavy falls. That night he attended a party from which he did not return until early in the morning of June 7, when he retired. He arose about noon the next day and prepared for himself and consumed an average breakfast. He then worked quietly on a boat which he was building. About 2:00 p.m. he came into the house complaining of discomfort in his chest and slight dyspnea which he attributed to his excessive activities of the past day and night. He alternately dozed and rested that afternoon. That evening he declined food, which was unusual. At 8:00 p.m., his mother, a graduate nurse, became suspicious that his symptoms were not due entirely to his fatigue. She found his temperature to be just over 99° F and his pulse to be irregular. A pediatrician, who had seen him through all of his childhood illnesses, was consulted, though the patient's mother realized the incongruity of calling him about this young adult who was then 6' 3" in height and about 180 pounds in weight. The pediatrician, familiar with such "emergencies," advised sedation and a consultation the following morning, Sunday, June 8, between himself, an internist, and a roentgenologist. The patient's symptoms had subsided slightly and the physical findings were less pronounced at the time of the consultation. At the outset, it was agreed upon by the consultants that chest

roentgenograms were indicated. While these were being procured the consultants indulged in a discussion concerning the differential diagnosis. The patient's mother, who was present at the discussion, recalls that several diagnostic possibilities were mentioned with coronary thrombosis figuring among the possibilities. She states that she felt "sick" during the discussion, being greatly alarmed about the patient's pain, fever and abnormal pulse. She, particularly, but apparently all present, were greatly relieved to see the result of the roentgenographic examination (Figs. 1 and 2) which revealed that his condition was the result of mediastinal emphysema. The patient's physical activities were restricted, he was given antibiotics prophylactically for a short time and was allowed to return to his normal regime in about ten days. There has been no recurrence of symptoms or signs since his initial attack, though he is leading a very active life as a jet pilot in the Air Force.

Mediastinal emphysema is a condition which ranks low, chest-wise, in this day and age of "coin lesions," tuberculomas, photofluorograms, hamartomas, bronchogenic carcinoma, segmental resections, and cigarette smoking. However, it is worthy of consideration because it must be included in the differential diagnosis of clinical pictures in which chest pain or discomfort is a signal symptom. In reviewing the literature on this condition, I was impressed by the similarity of the opening paragraph of a preponderance of writers since Hamman in 1938¹ invited his audience, at the second Henry Sewall Lecture in Medicine, to go back with him one hundred years to matters novel and absorbing to physicians of that time. Hamman cited the revolutionary discoveries of Laennec in physical diagnosis. Doctor Hamman's opening paragraphs of this lecture are heartily recommended for all physicians' persual because of his remarks concerning the accumulation and integration of medical knowledge. Incidentally, Dr. Hamman in that lecture described the sign in physical diagnosis which immortalizes

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his name. He noted the sign as a "most extraordinary, crunching, bubbling sound" over the apex of the heart at each impulse. His first patient, a physician, could bring on the sound by

its association with alcoholism, due to spontaneous rupture of the esophagus from retching.⁷ I shall report two cases of such a rupture in which one patient was known not to be an alcoholic and

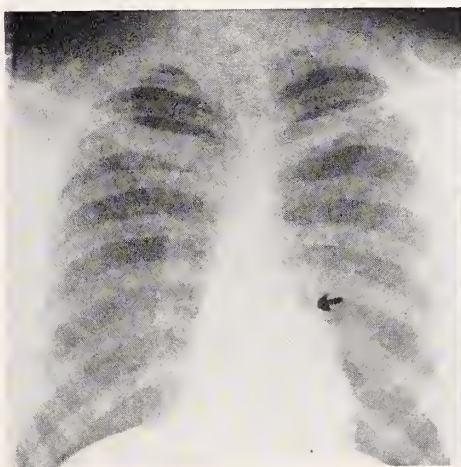


Fig. 1, Case 1. Arrows indicate the mediastinal air.



Fig. 2, Case 1. Arrows indicate the mediastinal air.

shifting his position to that in which both patient and examiner could hear it simultaneously, evidently to their joint delight.

Dr. Hamman, whose name is so strongly linked to mediastinal emphysema, delivered the Frank Billings Lecture on his favorite topic before the American Medical Association in Chicago on June 14, 1944.² His lecture and bibliography brought the topic up to date at that time. Unfortunately, he apparently did not have access to what I believe to be the classic article on the subject. This article was published by the Macklins of the University of Western Ontario in December, 1944.³ The Macklins' exhaustive treatment of the subject covers all necessary experimental, historical and clinical aspects to furnish a well-grounded concept of the condition for anyone especially interested. Evans and Small-don presented a paper entitled "Mediastinal Emphysema" at the American Roentgen Ray Society meeting in October, 1949,⁴ which brought into focus present roentgenologic ideas on the subject. From time to time, articles appear which call attention to the importance of diagnosing mediastinal emphysema. Differential diagnosis from myocardial infarction is often considered an important diagnostic procedure⁵; however, a paper appeared citing two cases in which the conditions were associated.⁶ Another article discussed the condition, suggesting the possibility of

there is good evidence that the other was not. Towbin mentions in the opening paragraphs of his article on the subject practically all of the conditions which are known to give rise to it.⁸

Air may gain access to the mediastinum by way of the interstitial tissues of the lungs. Macklins' experiments and others cited by them demonstrate the mechanism by which rupture of the pulmonary alveolar bases allows the escape of the air principally into the vessel sheaths. Air may also escape from alveolar bases which rest upon interstitial tissue, if the expansion of the bases is greater than that of the underlying interstitial tissue. The sheaths of the pulmonary vessels then carry the air to the mediastinum by reason of the normal physiologic expansion and contraction of the contents of the sheaths and also because these sheaths are the paths of least resistance. The escaped and escaping alveolar air is literally "pumped" along these sheaths. After reaching the mediastinum, air may dissect along the fascial planes into the neck, face and axillae and sometimes down over the chest, arms, abdomen and even the legs. Air may even infiltrate the perirenal tissue by dissecting down the aortic sheath (*Jehn and Nissen: Pathologie und Klinik des Mediastinal Emphysems. Deutch Ztschr. f. Chir., 205:221, 1925, quoted by Evans and Small-don*). Rupture of the mediastinal pleura may follow mediastinal emphysema producing pneu-

mothorax. Pneumothorax is such a common occurrence in the condition that the subjects cannot be considered entirely separately. The Macklins feel that pneumothorax of the so-called spontaneous type usually results from pulmonary interstitial emphysema and mediastinal emphysema. Their arguments are convincing.

It is a medical maxim that air may gain access to the mediastinum by way of the fascial planes of the neck. This view is supported by a study on 120 consecutive post-tracheotomy patients in the St. Louis Children's and City Hospitals in which 25 per cent of the individuals developed mediastinal emphysema.⁹ Surgeons have described hearing air being sucked into the mediastinum during thyroidectomy and tracheotomy. Persons doing this type of work may take some comfort in the Macklins' contention that mediastinal emphysema in these cases is often the result of pulmonary interstitial emphysema due to the condition for which the tracheotomy was performed. Thus they may feel that mediastinal emphysema and pneumothorax discovered after such operations are frequently not a result of their operative procedures.

Air may gain access to the mediastinum by way of the retroperitoneal fascial spaces. I have been unable to find a definite example of such a mechanism in my own experience though I have been shown such instances. In Case 9 in my series it is possible that air entered the mediastinum by way of the retroperitoneal route.

It is obvious that air may gain access to the mediastinum by reason of perforation of the trachea, esophagus, or bronchus.

It is my belief that the most common cause for the production of mediastinal emphysema and its frequent concomitant lesions, pneumothorax and subcutaneous emphysema, is a result of a pressure gradient between the alveoli and the interstitial tissues causing rupture of the alveolar bases. The Macklins state that rupture of the pulmonary alveolar base results from any of three conditions: "(1) those in which there is first an atelectasis of some part of the lung, followed by hyperinflation in adjoining regions of the same or in the opposite lung; (2) those in which there is a general overinflation with or without increased intra-alveolar pressure; (3) those in which there is evident a decreased blood supply to the pulmonary vessels preferably either with increased

intra-alveolar pressure, or with hyperinflation."

In the newborn, the conditions cited by the Macklins to produce a pressure gradient between the alveoli and their supporting structures are apt to be present most effectively. The lungs may not expand properly. This atelectasis allows for hyperinflation of surrounding areas and hyperinflation may be added to by attempts at resuscitation. Then, too, imperfect closure of the ductus arteriosus may be present with poor establishment of pulmonary circulation. Circumstances at the time of birth are such that they would seem to beg for alveolar base rupture, pulmonary interstitial emphysema and ensuing conditions.

Case Reports

Following are brief examples of this condition which I have been able to assemble, with short comments on each. Only typical illustrations are shown.

Case 1 (SJ 19146).—No doubt this patient incurred his mediastinal emphysema as the result of pulmonary interstitial emphysema occasioned by his water skiing on the day his symptoms developed. He undoubtedly fell with inflated lungs and a closed glottis, thus performing involuntarily the Valsalva experiment. It seems evident that the leakage continued for at least twenty-four hours when the symptoms became pronounced.

Case 2 (SJ 49334).—This twenty-five-year-old semi-student played football strenuously three days before admission. He entered the hospital complaining of substernal pain of two days' duration, aggravated by exertion and relieved by assuming the erect posture. It radiated to the left shoulder. He stated that he heard a gurgling sound with every beat of his heart at the onset of the illness. This noise was audible to him when he was lying on his back. Unfortunately, the intern in recording the physical examination failed to mention the sound. He missed the significance of it and it was his impression that the patient had either pericarditis or coronary insufficiency, but the resident in radiology was able to elicit Hamman's sign. The patient was discharged symptom-free after four days. The mechanism of the emphysema was similar to that in Case 1.

Case 3 (SJ 64904).—A ten-year-old boy was admitted to the hospital for evaluation of a suspected congenital heart lesion. His roentgenograms revealed that mediastinal emphysema was present. Hamman's sign was not elicited, probably because of a "Grade IV systolic murmur with thrill heard over the entire precordium and a Grade I diastolic murmur heard at the apex." The mediastinal emphysema was apparently an accidental finding but because of its presence, cardiac catheterization was not carried out as had been intended. The mechanism of the production of mediastinal emphysema was apparently similar to that in the previous two cases, the so-called spontaneous type.

Case 4 (SJ 61440).—An elderly man has a diagnosis of rather rapidly progressive chronic interstitial pneumonia. His symptoms were aggravated late in November, 1954. On admission to the hospital, roentgenograms

demonstrated a 1.5 cm. rent in the esophagus just above the diaphragm. No cause for the perforation was apparent. Mediastinitis and bilateral pleural empyema were present. (Fig. 4) No history of alcoholism could be



Fig. 3, Case 5. Arrows indicate retroperitoneal air.

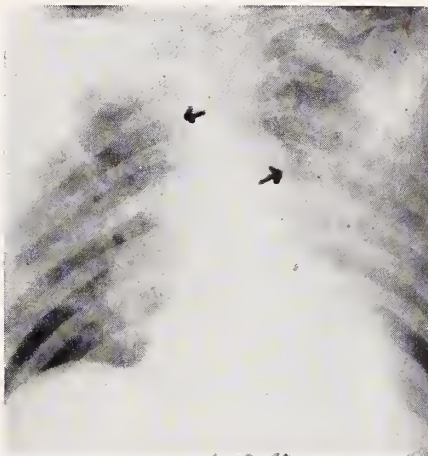


Fig. 4, Case 5. Arrows indicate mediastinal air. The lungs are markedly congested.

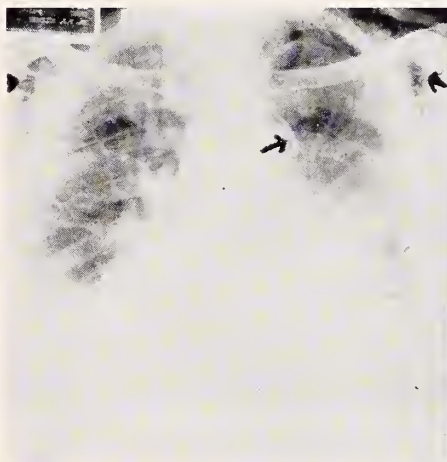


Fig. 5, Case 6. Note axillary subcutaneous emphysema and (central arrow) mediastinal air.



Fig. 6, Case 8. Note similarity to Figure 5.

showed mediastinal emphysema, together with slight collapse of the left lung due to pneumothorax. No pleural blebs were demonstrable. The findings were almost surely based on the mechanism of pulmonary interstitial emphysema following alveolar rupture.

Case 5 (SJ 48112).—A seventy-three-year-old man suddenly became nauseated after his evening meal. He vomited and, upon vomiting, was seized with a severe pain in the epigastrium. Upon hospitalization the findings indicated a ruptured hollow viscus. Roentgen examination revealed slight but definite evidence of mediastinal emphysema and retroperitoneal gas or air. (Fig. 3) Laparotomy was performed and no lesion was found. Two days later a chest roentgenogram made at the bedside demonstrated marked mediastinal emphysema, and the patient died a week after admission. Autopsy

obtained and it was said that the patient had led an exemplary life.

Case 6 (B 39341).—A sixty-four-year-old man suddenly fell ill, thirty-six hours before hospitalization, with vomiting, severe epigastric pain and difficulty in breathing. The striking findings were subcutaneous emphysema on physical examination and mediastinal emphysema on roentgen examination. He was in shock and in such poor condition that surgical intervention was never considered. He lived two and one-half days after admission, developing pneumothorax and subcutaneous emphysema down to the pelvis. (Fig. 5) Autopsy revealed a 3 cm. tear in the esophagus without apparent cause. The attending physician, who was also the patient's nephew, states that the patient did not use alcohol.

Case 7 (SJ 51915).—A forty-two-year-old man had surgical removal of the lower part of the sternum because of a tumor. His roentgen examination after operation furnishes a classic example of mediastinal emphysema

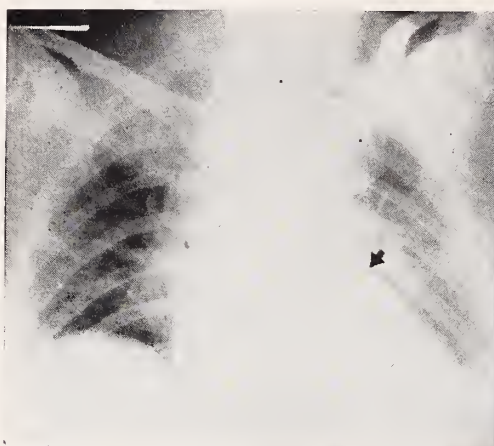


Fig. 7, Case 10. Air in mediastinum due to ruptured esophagus.

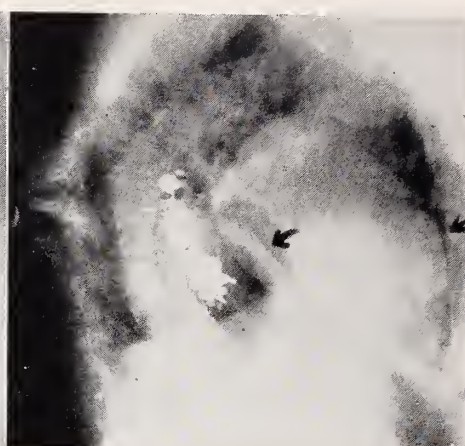


Fig. 8, Case 11. Arrow on reader's right points out anterior mediastinal air. Central arrow shows air surrounding hernia sac. Lipiodol given orally partially superimposed on sac.

and his history leaves no doubt as to the mechanism of the introduction of the air. The tumor was a metastasis from carcinoma of the thyroid.

Case 8 (SJ 62833).—A twenty-seven-year-old woman had a segmental resection for a tuberculous granuloma in the left upper lobe. Postoperatively, air was recognized roentgenographically in the subcutaneous soft tissues, in the pleural cavity, and in the mediastinum. The roentgen appearance does not differ from cases in which these conditions arise from other than surgical trauma (Fig. 6).

Case 9 (B 24825).—A middle-aged man underwent a total gastrectomy for gastric and duodenal ulcer. The procedure was poorly tolerated, the patient's condition was not good during the operation, and he died eight hours after the surgery. A roentgenogram of the chest made in the post-anesthesia room revealed mediastinal emphysema and subcutaneous emphysema. This may be an example of air entering the mediastinum by way of the retroperitoneal tissues. It could also be that the mechanism of entry was due to the factors responsible for the patient's poor condition during surgery. Pulmonary interstitial emphysema may have initiated the difficulties.

Case 10 (SJ 32225).—A sixty-two-year-old man was admitted to the hospital for study because of dysphagia. A long constricting lesion of the lower third of the esophagus was discovered on roentgen examination. At subsequent esophagoscopy, the lesion, later shown to be inflammatory, ruptured and mediastinal emphysema ensued. The mechanism responsible for the condition is obvious. (Fig. 7)

Case 11 (M 10874).—An elderly woman, known to have a large esophageal hiatal hernia, entered the hospital for removal of an ingested foreign body in the esophagus. A splinter of bone was removed. Nine hours

later, subcutaneous emphysema was noted. Administration of a little lipiodol by mouth demonstrated a rupture of the esophagus about 4 cm. below the level of the aortic arch. Air was present in the mediastinum anteriorly and also posteriorly where it outlined the hernia sac in an unusual manner. The patient did not survive. In this instance, the means of entry of the air into the mediastinum was also obvious. (Fig. 8)

Case 12 (M 18239).—A fifty-five-year-old man came to the hospital complaining of dysphagia of a few hours' duration after eating a pheasant dinner. Roentgenograms demonstrated a fragment of bone in the lower cervical esophagus, and an attempt to remove it was unsuccessful. Mediastinal air, evidence of mediastinitis and subcutaneous emphysema are seen on a chest roentgenogram made two days later. Another examination, six days after the attempt at endoscopic removal of the foreign body, is interesting in that it makes visible two routes by which air presumably could enter the mediastinum. The presence of a tube in the trachea and an esophageal rupture are seen. This patient did not survive the perforation of the esophagus and the mediastinal infection which followed (Figs. 9 and 10).

Case 13 (SJ 65294).—A new born male infant delivered by Cesarean section three weeks before the expected date of delivery because of Rh factors consistent with possible erythroblastosis, was considered to be doing well for the first hour of life. It was then noted that respiratory difficulty was developing. Roentgen examination revealed marked bilateral atelectasis, mediastinal emphysema and left pneumothorax. Death occurred about twenty-four hours after delivery. After study of the material obtained at autopsy the pathologists

concluded that death was due to the presence of hyaline membrane, although there were microscopic findings of erythroblastosis in the liver and spleen. Conditions were ideal for alveolar rupture with its resultant events.

case is another example of pulmonary interstitial emphysema with its attendant conditions, resulting from over-inflation or raised intra-alveolar pressure, either of which can well happen during the course of a tonsillectomy.

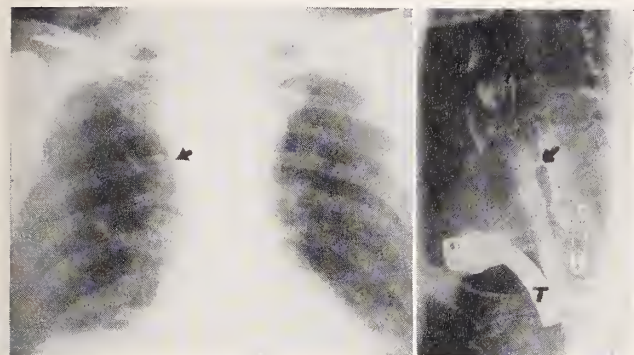


Fig. 9, Case 12. (left) Demonstrates widening of mediastinum due to infection. Arrow indicates air.

Fig. 10, Case 12. (right) Arrow points to esophageal perforation with leakage of ingested lipiodol into mediastinum. Tracheotomy tube (T) was also seen.

Case 14 (SJ 63233).—This newborn full term female infant was in respiratory distress from the time of birth. Examination demonstrated a startling similarity between the appearance of her chest roentgenograms and those of the infant reported in Case 13. She responded well to treatment and seemed to be normal a few days later.

Case 15 (SJ 24298).—Roentgen examination of the chest of a newborn infant in slight respiratory distress revealed several long pockets of air in the mediastinum and evidence of atelectasis in the right lung. Supportive care resulted in an improvement in symptoms. The infant was discharged with his mother on the fifth day of his life. This is a typical case of mediastinal emphysema occurring in the newborn.

Case 16 (SL 87933).—This child was admitted for tonsillectomy. During the operation, subcutaneous emphysema appeared in the neck, which progressed post-operatively to the stage seen on x-ray examination. (Fig. 11) Mediastinal emphysema was also demonstrated. This is seen best on the lateral view where it can be traced in the mediastinum directly along the fascial planes to the cervical region. This case brings out well the importance of the lateral view in demonstrating the condition under discussion. The aberrant air may not always be manifest on postero-anterior projections, especially when consideration is given to the fact that many of the examinations are made at the bedside and film quality is apt to be poor. It is barely conceivable that (1) air entered the tonsillar bed as a result of operation, (2) air could be forced into the parotid duct from the anesthetic implement, or (3) a vesicle ruptured under the pleura with subsequent dissection of this air around the pleura in the hilum and mediastinum. All of these reasons have been advanced for the production of mediastinal emphysema following tonsillectomy. This

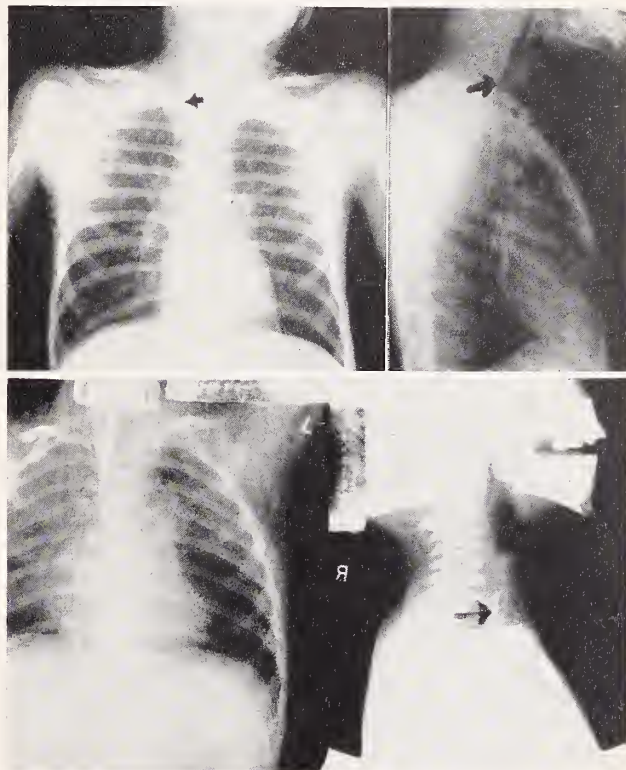


Fig. 11, Case 16. (above) Arrows indicate mediastinal and other aberrant air.

Fig. 12, Case 17. (below) Roentgenogram on reader's right shows bone in esophagus. That on left shows emphysema.

Case 17 (SJ 62944).—This case is an example of nearly all the possible known causes of mediastinal emphysema. Four days previous to our observation, this two-and-one-half-year-old boy had been eating chicken pie when he stopped eating, coughed, refused to take much more food and began to regurgitate most of the solid food which he had accepted. That same evening he was seen in another hospital and his parents were told there was nothing wrong. He had been lethargic and ate poorly during the intervening time. On admission a lateral roentgenogram of the cervical region revealed a disproportionately large foreign body (bone) in the upper esophagus. This relatively enormous bone was removed endoscopically, and considerable manipulation was required. An area of puncture was seen on the esophageal wall, so it was known that at least the muscularis had been entered. Because of perilaryngeal edema, a tracheotomy was performed. Since it was feared that an abscess would develop, the soft tissues were then dissected from the left lateral trachea and esophagus and a Penrose drain was inserted. His recovery was rapid and uneventful. He was hospitalized for seven days. This boy had been subjected to severe cough, perforation of at least the muscular coat of the

esophagus, tracheotomy and drainage of the mediastinum. One may take his choice of the possible mechanisms to explain the mediastinal emphysema in this individual (Fig. 12).

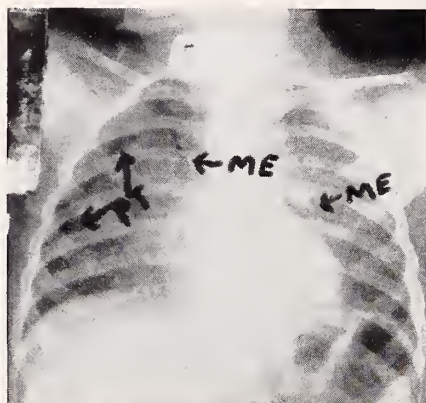


Fig. 13, Case 19. ME shows mediastinal emphysema. PT indicates right pneumothorax.

Case 18 (SL 83054).—This female infant coughed and developed respiratory distress while eating peanuts, and roentgen examination failed to make a definite diagnosis possible as to the location of the aspirated material. However, the history and symptoms were such that bronchoscopic examination had to be done. A peanut was discovered on the carina, which explained the failure of the pre-operative recognition of the exact location of the foreign body. The nut was so large that it could not be removed through the glottis and so it was taken out through a tracheal incision. A tracheal tube was required for only a few hours. Before removal of the peanut, there was no mediastinal emphysema, subcutaneous emphysema or pneumothorax. After removal, all three conditions were demonstrated. The mechanism of their production was probably pulmonary emphysema as the "streaky" appearance of the lungs indicated that such emphysema was present. The concept that mediastinal emphysema arises often from opening of the trachea cannot be entirely discredited even though pre-operative roentgenograms did not show it.

Case 19 (SJ 59882).—A sixteen-month-old male infant was admitted with a history of hoarseness for less than twenty-four hours. About four hours prior to admission he was seen at home by a pediatrician because he was developing fever and was coughing. Penicillin was administered and he seemed to be doing well until he was given a bottle of milk about forty-five minutes before admission. He "choked" and developed severe respiratory difficulty at this feeding. On admission, his temperature was 104°F, there was substernal and suprasternal retraction, and breath sounds were absent on the right and over the left upper chest. A diagnosis of acute laryngotracheobronchitis with upper respiratory obstruction was made, and an emergency tracheotomy was done. He improved following this procedure. Twelve hours later a film made at the bedside revealed mediastinal emphysema and pneumothorax on the right (Fig. 13).

One cannot be sure as to the mechanism of the production of these conditions in this case. The observation that breath sounds were absent on the right and over the left upper chest at the time of hospital admission

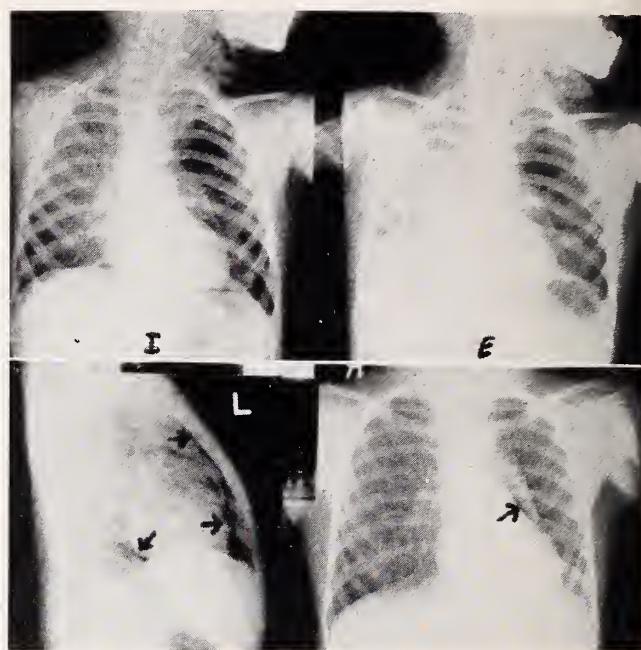


Fig. 14, Case 21 (above) I indicates inspiratory phase. E indicates expiratory phase.

Fig. 15, Case 22. (below) Typical example of mediastinal emphysema.

would indicate that the conditions were present then. However, here again, it cannot be stated dogmatically that the tracheotomy made before roentgen examination had nothing to do with their production.

Case 20 (SJ 34099).—A seven-year-old boy was admitted to the hospital after being ill for two days with an acute respiratory infection. Poliomyelitis was initially suspected but had been ruled out at another hospital. The admitting diagnosis was tracheitis. Roentgenograms made on admission revealed mediastinal emphysema and subcutaneous emphysema. Therapy, using antibiotics and oxygen, resulted in a rapid recovery and he was discharged on the seventh day of hospitalization. There can be no doubt in this case that air entered the mediastinum and subcutaneous tissues as a result of alveolar rupture, as there were no other pathways available.

Case 21 (SJ 62075).—A twenty-six-month-old girl had a choking spell while eating peanuts five days before admission to the hospital. Fever up to 104°F, frequent coughing and choking spells, refusal to eat well, and vomiting had been present since then. On the day of admission subcutaneous emphysema of the neck and upper chest developed. The initial roentgenograms disclosed mediastinal emphysema, subcutaneous emphysema, left pneumothorax, pulmonary interstitial emphysema and obstructive emphysema of the left lung (Fig. 14). It is interesting to note dissection of air into the sheath of the right side of the diaphragm. All of the findings

TABLE I.

Case Number	Hospital Number	Precipitating Cause	Pneumo-thorax	Subcutaneous Emphysema	Probable Mechanism	End Result
1.	SJ19146	Sports activity	No	No	Pulmonary interstitial pneumonia	Recovery
2.	SJ49334	Sports activity	No	No	Pulmonary interstitial emphysema	Recovery
3.	SJ64904	None known	No	No	Pulmonary interstitial emphysema	Recovery
4.	SJ61440	Chronic interstitial pneumonia	Yes	No	Pulmonary interstitial emphysema	Progressive disease
5.	SJ48112	Rupture of esophagus following vomiting	No	No	Physiologic trauma	Death
6.	B39341	Rupture of esophagus following vomiting	Yes	Yes	Physiologic trauma	Death
7.	SJ51915	Operation on sternum	No	No	Surgical trauma	Recovery
8.	SJ62833	Segmental resection left upper lobe	Yes	Yes	Surgical trauma	Recovery
9.	B24825	Gastrectomy	No	Yes	Pulmonary interstitial emphysema?	Death
					Surgical trauma?	
10.	SJ32225	Esophagoscopy for diagnosis	No	No	Perforated esophagus	Recovery
11.	M10874	Foreign body in esophagus	No	Yes	Perforated esophagus	Death
12.	M18239	Foreign body in esophagus	No	Yes	Perforated esophagus	Death
13.	SJ65294	Respiratory distress, newborn	Yes	No	Pulmonary interstitial emphysema	Death
14.	SJ63233	Respiratory distress, newborn	Yes	No	Pulmonary interstitial emphysema	Recovery
15.	SJ24298	Respiratory distress, newborn	No	No	Pulmonary interstitial emphysema	Recovery
16.	SL87933	Tonsillectomy	No	Yes	Pulmonary interstitial emphysema?	Recovery
					Surgical trauma?	
17.	SJ62944	Foreign body in esophagus	Yes	Yes	Perforated esophagus?	Recovery
					Tracheotomy?	
18.	SL83054	Foreign body in trachea	Yes	Yes	Pulmonary interstitial emphysema?	Recovery
					Tracheotomy?	
19.	SJ59882	Laryngo-tracheo-bronchitis	Yes	No	Pulmonary interstitial emphysema?	Recovery
					Tracheotomy?	
20.	SJ34099	Tracheitis	No	Yes	Pulmonary interstitial emphysema	Recovery
21.	SJ62075	Foreign body in bronchus	Yes	Yes	Pulmonary interstitial emphysema	Recovery
22.	SJ59103	Bronchopneumonia	No	No	Pulmonary interstitial emphysema	Recovery
23.	J5101	Fall from roof	Yes	Yes	Pulmonary interstitial emphysema	Death
24.	J9101	Fall down stairway	Yes	Yes	Pulmonary interstitial emphysema?	Recovery
					Rib fracture?	

were interpreted as arising from a nonopaque foreign body in the left main bronchus. After removal of the peanut, the patient made a rapid and uneventful recovery and was discharged on the fourth hospital day. The mechanism of displacement of the thoracic air into the several abnormal locations must be pulmonary interstitial emphysema due to alveolar rupture, as no other factor could be identified.

Case 22 (SJ 59103).—A five-year-old girl was admitted with a diagnosis of bronchopneumonia after an illness of twenty-four hours. Mediastinal emphysema was demonstrated on roentgen examination. (Fig. 15) Oxygen therapy and antibiotic medication resulted in a rapid drop in fever, decrease in cough, and in disappearance of dyspnea. The patient was sent home after four days of hospitalization. This is another example of acute respiratory infection with no apparent cause for the accompanying mediastinal emphysema. Thus, it must be concluded that alveolar rupture caused by subsegmental atelectasis and hyperinflation were responsible.

Case 23 (J 5101).—This fifty-year-old man, who fell off a roof while doing construction work, was found to have slight mediastinal emphysema along the right side of the mediastinum on admission. No rib fractures were demonstrated. There was slight atelectasis in the right base. Two days later, there was moderate collapse of the right lung by pneumothorax, marked mediastinal emphysema and marked subcutaneous emphysema of the chest wall bilaterally with extension of the emphysema up into the neck. Free air was also demonstrated in the abdominal cavity. The patient died eight days after admission to the hospital. At autopsy, it was found that there was a fracture of the sternum as well as fractures of the pelvis and of two vertebrae. Here again, it seems that pulmonary interstitial emphysema was the basis for the other findings.

Case 24 (J 9101).—On admission to the hospital, a fifty-eight-year-old man, who had fallen down a stairway, was found to have mediastinal emphysema of moderate degree and marked subcutaneous emphysema over the left side of the chest and extending into the left side of the neck. A fracture, without displacement, of the left fourth rib was demonstrated in the axillary region. There was minimal pneumothorax on the left demonstrated only by a fluid level in the posterior gutter along the diaphragm. Pulmonary interstitial emphysema seems to be the most likely cause for the development of mediastinal emphysema in this patient, although it could be argued that a laceration of the lung caused by rib fracture might be responsible. The patient made an uneventful recovery and was discharged from the hospital in five days.

Summary

To summarize, twenty-four examples of mediastinal emphysema have been presented. The age incidence varies from premature infants to a seventy-three-year-old man. Sixteen of the cases shown were males. In the majority, pulmonary alveolar rupture seems to have been the source of the aberrant air, although it can be argued that in about one-half of the cases some other mechanism was or could have been responsible. Subcutaneous emphysema accompanied mediastinal emphysema in twelve of the cases, pneumothorax was a concomitant finding in eleven, and both were present in seven. Death was the outcome in seven of the cases shown, and in one the condition is an incident in a progressive dis-

(Continued on Page 421)

Obstetric Conditions Predisposing to Newborn Anoxia and Neonatal Death

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IN RECENT years, as maternal mortality has been greatly reduced, obstetricians have paid increasing attention to the survival rate of newborn infants. Every year in the United States, nearly 40,000 infants fail to survive the first twenty-four hours of life. About 40,000 more never live out the first month. Still, twenty out of every 100 babies born in the United States die before they are ten days old. If we are to further reduce infant deaths, we must succeed in reducing the causes of death in neonatal period (death of infants less than twenty-eight days old). More attention should be given to the immediate postpartum care of the newborn infant, especially during the first eight to ten minutes after birth, when conditions occur which often lead to death in the early hours or days of fetal life. This critical period is definitely the obstetrician's responsibility. Of all the neonatal deaths studied in the 1953 Hennepin County Neonatal Mortality Study, 12 per cent occurred during the first hour of life; almost 60 per cent within the first twenty-four hours.¹

Prematurity is by far the major cause of neonatal deaths. For every term death there are approximately sixteen premature and 150 preventable premature deaths. Schmitz and his associates² found that prematurity with abnormal pulmonary ventilation was the cause of 61.2 per cent of 160 neonatal deaths. Proper care and handling of premature labor and the premature infant represent the ultimate in obstetric and pediatric refinement. Potter³ states that, if we could determine the cause of prematurity and eliminate it, we could cut our death rate in half. If there were not a premature labor, there would not be a premature baby (1000-2500 gms. or 2.2-5.5 pounds). Some premature births are, of course, not spontaneous; they are the result of labor having been induced

or Cesarean section. The exact cause of prematurity can be determined in about 40 per cent of cases. Walker⁴ states that it is not much help to know that a baby died of anoxia or prematurity and atelectasis unless the origin of these conditions is known. Prematurity should be anticipated in order to prevent delay in diagnosis. The safest way still to deliver a premature infant is from below with wide episiotomy and outlet forceps. A minimum of anesthesia or none at all should be used.⁵

"Out of Sight—Not Out of Mind" was the intriguing title used by Dr. Clyde Randall as guest speaker at the 1956 Central Association meeting held in New Orleans (October). He aptly classified anoxias as follows:

1. *Stagnant anoxia*—associated with abruptio placenta, prolapsed cord, and toxemia.
2. *Anemic anoxia*—due to vasa previa, congenital heart disease, and cerebral hemorrhage.
3. *Anoxic anoxia*—(doped baby) caused by drugs (morphine, et cetera) and anesthesia.
4. *Neurogenic anoxia*—seen in congenital cerebrospinal disease.

Anoxia and asphyxia from abnormal pulmonary ventilation are difficult to dissociate and are considered together. Resuscitation of the newborn is chiefly a problem of factors in prevention rather than treatment. By preventing these conditions in the newborn, which are so frequently associated with maternal complications of pregnancy and delivery, the obstetrician can greatly reduce the need of resuscitation. Cyanosis should be heeded as a danger signal and sign of fetal distress. Atlee⁶ feels that a baby should be kept in the obstetrician's hand until he is breathing properly and is of a good pink color. Abnormal pulmonary ventilation and anoxia accounted for 62 per cent of neonatal deaths in both the 1952⁷ and 1953¹ Hennepin County series. This figure is almost identical with that quoted by Schmitz.²

In the 1953 Hennepin County Neonatal Mortality Report of 372 mothers and 379 offspring,¹

Presented as one of three papers in "A Symposium on Anoxia of the Newborn: Its Prevention and Treatment," at the combined meeting of the Minneapolis Obstetric-Gynecology Society and the Minneapolis Pediatric Society, Minneapolis, Minnesota, January 16, 1957.

obstetric complications were encountered in 138 pregnancies, or 37 per cent. As in previous reports, obstetric complications, mostly abnormalities of pregnancy, namely, abruptio placentae, placenta previa, undiagnosed types of antenatal hemorrhage, and toxemia, were considerably more common in premature deliveries. In thirty-five cases of antepartum bleeding, the cause or etiology was listed as unknown. It is felt that a definite diagnosis could have been made in most of these cases. Bleeding in pregnancy usually means some placental separation, which means some hypoxia of fetus. Often an expectant management with sensible precautions does not compromise the mother's safety. In the interest of the fetus and the avoidance of fetal wastage, the best possible procedure is prolonging gestation, if possible, to the relatively safe period of thirty-six weeks and beyond. The chief causes of intrauterine anoxia or asphyxia (the main cause of fetal loss) are placenta previa and accidental hemorrhage, which cause about 40 per cent of perinatal loss. Eastman⁸ claims the opinion is growing that anoxia consequent to various degrees of placental separation is a most important cause of cerebral palsy. It is emphasized that the discard of the bag and use of combined podalic version in placenta previa will greatly reduce fetal mortality.

Early detection and treatment of toxemic factors should be emphasized. Prevention of progression of maternal toxemia, to the point that the fetus is jeopardized by it, is obligatory. Near term there is no problem other than the method of delivery. One should attempt to carry the pregnancy through the thirty-third or the thirty-fourth week to increase, if possible, the premature survival rate. Prior to this time a true toxemia patient poses a serious problem. Many fetuses die *in utero* after two or three weeks of persistent toxemia.

Further reduction in perinatal mortality requires improvement of prenatal care and maternal health starting early in pregnancy, especially in the irresponsible woman and those of low economic social status. Early detection and adequate treatment of anemia with maintenance of proper nutrition should be emphasized. Maternal cardiac disease and diabetes with its often associated oversized immature babies and high incidence of toxemia demand early diagnosis and the aid of an internist. Particular efforts must be made to

find mothers who have a history of premature births, repeated abortions and miscarriages.

In the 1953 Hennepin County Report,¹ the Rh factor was determined in only 70 per cent of the mothers. Erythroblastosis was the cause of neonatal death in 5 per cent of cases. It is well known that babies sensitized to the Rh factor do not tolerate prematurity well. Evans⁹ believes that if prematurity is no longer a major factor in fetal survival, premature delivery is occasionally justified when previous pregnancies have repeatedly ended in early fetal deaths and the father is homozygous Rh. The obstetrician gives diagnostic and preventive care, the pediatrician provides therapy.

The percentage of deaths due to infection in the 1953 Hennepin County Report¹ was about 7 per cent; for full term babies only, 13 per cent. Birth injury mortality was 6.3 per cent in the 1953 series, but, for full term infants only, rises to 10 per cent. The type of delivery is closely associated with birth injury. Trauma of abnormal labor and associated anoxia still takes too great a toll of infant life. In term infants 89 per cent of deaths are due to birth injuries or anoxia, many of which could possibly be prevented. Gold¹⁰ recommends that consultation with qualified obstetricians should be required in all obstetric operations other than low forceps delivery. Some injuries at birth, especially in unskilled hands, are relatively more common in these cases than in the nonoperative deliveries. Fetal salvage with operative delivery has not improved.

All cases of difficult vertex delivery should be given a good trial of second stage labor before a difficult forceps delivery is performed. Schmitz² reported ninety-nine midforceps deliveries with five neonatal deaths. The avoidance of difficult midforceps with better studied management of midpelvic contraction and labor is advised.

Particular care must be exercised in delivery of the premature breech, which carries the highest mortality.⁵ The smaller the infant, the greater the likelihood that it will deliver as a breech. In the 1953 Hennepin County Series, ninety of the 379 neonatal deaths (24 per cent) were delivered by breech.¹ Of this number, seventy-eight were listed as premature. In premature infants the body is smaller than the aftercoming head and the latter may be caught in the incompletely dilated cervix. Calkins¹¹ warns that artificial rupture of membranes should be strictly avoided, if possible, until

the baby is ready to be delivered. Many advocate external version when feasible at thirty-four to thirty-five weeks.¹²

It is estimated that 85 per cent of twin pregnancies terminate prematurely, on the average about three weeks before term, with more than ten times the usual premature death rate. About 15 per cent of all premature infants are twins with incidence of toxemias three times as common as in single pregnancies. Because of the excessive fetal bulk often associated with hydramnios, the cervix may become effaced and two to three cm. dilated any time in the last trimester. Increased mortality in multiple pregnancies is proportionate to the incidence of prematurity and complicated deliveries with the second twin.¹³ Early diagnosis and better prenatal care with restriction of activities from the seventh month is recommended.

Again the relatively high incidence of Cesarean section in neonatal deaths was due to obstetric complications (twenty-two of thirty-two cases).¹ There were thirty-two section deaths, or 8.4 per cent incidence, in the 1953 Hennepin County series. Most of these were done to deliver an immature infant, especially for emergency section in placenta previa or abruptio placentae. Six neonatal deaths were associated with elective section, all of which were immature. It was felt that in several cases there was a definite error in the timing of the repeat elective section. There are frequently miscalculations as to the length of gestation. In these cases of doubt, consultation should be had, plus the necessary x-ray studies. An accurate appraisal of arrival at term is important in order that a premature infant will not be delivered by an ineptly timed and purely elective section. Frequently the records do not show the date of the last menstrual period. I would like to enter a plea for more accurate records as an aid in the study of these charts.

More consideration should be paid to the unborn child and fetal salvage.¹⁴ The use of proper pre-operative medication and anesthesia, affording maximum safe oxygen supply to the infant, is of paramount importance in Cesarean section. The safest anesthesia is usually regional, preferably direct infiltration or local anesthesia. Well-controlled spinal anesthesia administered by trained hands with oxygen inhalation is of value in selected cases. Inhalation anesthesia is still preferred by some when administered safely by a well-

controlled team in competent hands. The cord should be stripped at section before cutting. Many authorities recommend that gastric intubation in the newborn be done routinely in Cesarean section to prevent asphyxia from regurgitated and aspirated amniotic fluid; it seems to have some effect in reducing fetal mortality. A trained resuscitative team, well equipped, should be present at the delivery of all premature infants and at all Cesarean sections.¹²

At a recent Hennepin County Perinatal Committee meeting, the need was brought out for listening to and recording of fetal heart tones during labor and delivery. Several cases have been recently reviewed of normal spontaneous delivery of asphyxiated babies which failed to respond to resuscitation. No record of fetal heart tones prior to delivery could be found. These cases were listed as "cause of death unknown," but fetal distress with death *in utero* due to inadequate placentation was suspected. Intrauterine death and anoxia of fetus arises frequently from cord abnormalities with prolapse and compression. Baden¹⁵ says we might take an average figure of 1 per cent as the incidence of fetal deaths from cord anoxia. Although many of these deaths are nonpreventable, with routine planned care it is felt that one-half of this one per cent might be salvaged. Alertness is necessary for detecting prolapse cord with associated changes in fetal heart tone pattern. Randall believes that the low lying posterior placenta may be a dangerous site, causing pressure on a low cord and be an unsuspected cause of death. It also predisposes to premature rupture of membranes. Placental insufficiency is more apt to be associated with: (1) Post-maturity after forty-one weeks, especially if the amniotic fluid is brown-stained. The placenta is often small and senile, causing a failing oxygen supply to the fetus. (2) Cases of infertility, repeated abortions, and premature delivery. (3) Toxemia—small infarcted placenta (poor placentation). (4) Precipitous delivery. (5) Rapid delivery after pitocin induction. Pierce¹⁶ recently emphasized the indiscriminate use of oxytocics as a cause of preventable perinatal deaths.

Conclusion

Resuscitation of the newborn is chiefly a problem of prevention rather than treatment. There is much that the skillful physician and obstetrician

can do to reduce the incidence of premature birth and perinatal mortality if available knowledge and facilities are fully utilized to prevent and treat obstetric complications. The best possible obstetric care must be followed by adequate pediatric (post-natal) care. Everyone concerned must co-operate in the prevention of newborn infant mortality; this includes, besides the attending medical personnel, the mother herself, the hospital administration and the health officer.

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MEDIASTINAL EMPHYSEMA

(Continued from Page 417)

ease. Consideration should be given to the possibility of mediastinal emphysema in a variety of pathologic thoracic conditions.

Addendum

Since preparing this article late in 1954, I have encountered seven additional patients with this condition. Statistically, both by etiology and outcome, they show no significant difference from those included in this report. Examples of mediastinal emphysema produced by surgical opening of the mediastinum are not included as part of this addendum nor in the article proper, except that Cases 7 and 8 illustrate the fact that such cases cause the same roentgenographic findings as those due to other conditions.

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Resuscitation of the Newborn

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NEONATAL asphyxia has been defined as the failure of respiration in the newborn. A more proper term would be apnea neonatorum. Apnea exists when the baby fails to take a spontaneous respiratory movement within thirty seconds of severing the cord.¹

There is ample evidence to show that periods of insufficient oxygenation in the paranatal period produce certain irreversible changes in the cerebral cortex.²⁻⁴ Careful examination of paranatal records of mentally defective infants and children has disclosed a definite relationship between fetal oxygen want and later neurologic defect.⁵⁻⁷

The best clinical classification of asphyxia is that of Flagg:⁸

1. Mild Asphyxia
 - (a.) Infant resists movements of head and limbs
 - (b.) Muscle tone good
 - (c.) Conjunctival reflex present
2. Moderate Asphyxia
 - (a.) Muscle tone absent
 - (b.) No reflex irritation by aspiration of glottis
3. Severe Asphyxia
 - (a.) No response to resuscitation
 - (b.) No respiratory movement
 - (c.) No reflexes
 - (d.) A flicker of cardiac movement

In a review of 2,000 fetal and neonatal deaths Potter⁹ found asphyxia to be the final diagnosis of cause of death in 16 per cent. In the total autopsies, evidence of asphyxia was the pathologic state most frequently found and was present in 19.4 per cent.

Resuscitation is defined as the restoration to life or consciousness of one apparently dead. As commonly used, resuscitation of the newborn represents a method whereby oxygenation of the blood stream is enforced with the intent of establishing a normal spontaneous rhythm of respiration.

Presented as one of three papers in "A Symposium on Anoxia of the Newborn: Its Prevention and Treatment," at the combined meeting of the Minneapolis Obstetric-Gynecology Society and the Minneapolis Pediatric Society, Minneapolis, Minnesota, January 16, 1957.

Technique of Resuscitation

As outlined by Russ,¹ an efficient and thorough resuscitation must include all of the following principles: (1) Immediate warmth; (2) a minimum of handling; (3) a clear open airway; and (4) oxygenation of the blood stream within thirty seconds of severing the cord.

Immediate Warmth.—As implied, warmth should be instituted at the moment of birth. The baby should be received in a warm blanket and covered while the cord is allowed to pulsate. After severing the cord the infant is placed in a "baby warmer" or incubator. Today, many delivery rooms are air-conditioned and in such cases attention to warmth of the infant is particularly important. It is advisable to have the baby removed as soon as possible to the nursery, where, if air-conditioning is present, the temperature and humidity controls are more suitable to the newborn.

A minimum of handling.—An absolute minimum of handling is essential for any baby. The traumatic resuscitations as represented by accordion folding of the baby, tubbing, dilatation of the rectum, massage of the spine, rubbing the hard palate with gauze all cause more serious trauma than any permanent good they could do. Today these methods are largely abandoned. The only amount of handling that good resuscitation requires is the transfer from the delivery table to the incubator.¹

A clear open airway.—It is fundamental that no infant can breathe if a mechanical obstruction is present. Mouth to mouth breathing, stripping the trachea manually, use of the rubber syringe in the mouth are all methods which are based on the presumption that the airway is really clear. In the last analysis, a clear open airway in the asphyxiated infant is obtained by use of tracheal aspiration, either with blind manipulation with the DeLee suction trap or ideally under direct vision via the infant laryngoscope or bronchoscope.

Oxygenation of the blood stream.—This, oxygenation of the blood stream, is the ultimate aim of any resuscitation.

The umbilical cord contains between 80 and 200 cc. of blood, depending on the length and size of the cord and the maturity of the baby. As long as the cord pulsates, the infant is receiving adequate oxygen. To deprive the newborn infant of this blood is to conduct resuscitation under an added handicap.¹

Once the air passages are clear, oxygen may be administered in various ways. In the case of the moderately and severely asphyxiated infant, oxygen via the intratracheal catheter is most efficient. Great care must govern the amount of pressure exerted. Once respirations are established, oxygen is best given in an incubator where it can be humidified and its concentration carefully controlled.

Oxygen is the most potent and physiologic stimulant to the severely anoxic respiratory center.

After Care

Special nurses, trained in the duties expected of them, are truly the difference between life and death in many babies. Close observation for forty-eight to ninety-six hours is a prime necessity. A few points to be observed are as follows:

1. The baby is placed within an incubator. Following resuscitation, placing the head high so as to prevent the weight of abdominal organs on the diaphragm will often prove more beneficial than the conventional Trendelenburg posture. While in this position it is assumed there is continuous nursing observation.

2. Nothing is administered by mouth for twenty-four hours.

3. If apnea occurs, be prepared to repeat aspiration of the airway.

4. Oxygen, well humidified, is delivered to the incubator under temperature and humidity control. Care must be taken to insure proper oxygen concentrations over a period of time.

Drugs as Aids to Resuscitation

After careful investigation and evaluation, the American Academy of Pediatrics in 1954 stated in their text entitled, *Standards and Recommendations for Hospital Care of the Newborn*, "There is little justification for the use of so-called 'respiratory stimulants' such as alpha lobeline, coramine,

metrazol, et cetera. Moreover these drugs may act as poisons if given in excess."¹⁰ At best, these drugs produce a mild and fleeting stimulation with a few incoordinated gasps. The danger of their employment in infant resuscitation is that they can be potent convulsive agents.¹¹

There appears to be no drug of definite *primary* benefit in resuscitation of the newborn, although in certain instances they may offer minor assistance. Circulatory stimulants sometimes improve cerebral circulation and relieve the depression of the apneic infant, as, for example, caffeine with sodium benzoate 25 to 50 mgm., intramuscularly, or adrenaline 1:1000, 0.1 to 0.2 cc. intramuscularly.

Nalline is said to be specific as an antidote in treatment of morphine overdosage. It is not active against respiratory depression due to barbiturates. It may be given intramuscularly or intravenously to the mother prior to delivery or to the infant via the umbilical vein. The dosage is:

Adult, 5 to 10 mgm, intramuscularly or intravenously; *infant*, 0.1 to 0.2 mgm. intramuscularly or intravenously.

Drugs therefore play a very minor part in resuscitation.

Mechanical devices for giving oxygen (simple positive pressure or positive-negative pressure) should have built-in safety devices preventing pressure above certain safe levels. The usefulness of such mechanical devices in resuscitation is still controversial.

Summary

An efficient and thorough resuscitation must include all of the following principles: (1) Immediate warmth, (2) a minimum of handling, (3) a clear open airway, (4) oxygenation of the blood stream within thirty seconds of severing the cord.

For successful operation of these principles is added in liberal quantity, "physician good judgment." Knowledge of how to prevent asphyxia and to combat it when it does appear is a responsibility of paramount importance to the physician concerned with mother and infant alike.

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Excision of Small Breast Tumors

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ASSUMING that nothing is new in the technique concerned with breast surgery, one properly should be chary about presenting an "improved" technique in that field. However, after diligent search of the literature, I have failed to discover that anyone has considered the procedure of excision of a small breast nodule worth writing about. Therefore, without reference to past literature, I shall presume to offer an improved method of excision of a breast tumor.

Without reference to voluminous articles for proof of the point, it is believed that the reader will accept the fact that en masse removal of a small or medium-sized malignant tumor of the breast is associated with no increased danger of dissemination or lessening of the percentage of set interval cures because of a delay of several days, while awaiting the pathologist's report. If, then, these tumors have been and correctly will continue to be removed by the general practitioner, certainly any improvement in the method is a proper determinant for such an article as the one here presented.

One but has to examine a number of such breasts postoperatively to realize that there is definite room for improvement in the technique. In the immediate postoperative period, hemorrhage, resulting in a painful, discolored breast, is frequent. The obvious reason for this result is difficulty in locating and ligating bleeding points. Also, there presents massive hematomas which require removal, always invite infection, and usually result in a gross breakdown of the wound. Later, one sees a depressed scar due, for the most part, to the creation of a gourd-like wound in the fatty tissues which presents only disadvantages in closing.

The following technique results in the development of a "V" shaped wound, facilitates the control of hemorrhage due to accessibility to all parts of the wound at every stage of the procedure, and results in a cosmetically acceptable closure due to ease of coaptation of tissues. When one feels secure in not inviting a scar repulsive to the patient, he more readily removes an increased

amount of breast with the line of incision traversing, in any direction, any segment of the breast.

Technique

It is assumed that, except for very small tumors in which success is uncommon, the operator has determined by previous aspiration that he assuredly is dealing with a solid growth. The first step, and one governing the whole technique, is that of passing a guide silk through the tumor. In very small masses, this may be done with local anesthesia of the skin, allowing the palpating finger of the patient to assist the surgeon. General anesthesia is then administered. This at once fixes the mass (or elusive bit of tissue), assuring the surgeon that upon making the skin incision the neoplasm will not "vanish," leading to a most disconcerting search in a mass of unrevealing fat, resulting, in most such cases, in the wholesale dissection of the breast in the hope that somewhere in the removed portion the pathologist will discover the tumor. A large, curved, cutting needle is employed; the size of the curve varying with the case. This is threaded with a single or double silk, or fine wire of such strength as to withstand firm tension while it is tensed in traction. The needle with its trailing suture passes through the skin at some distance from the lateral edge of the tumor (about 2 cm.), traverses the breast tissue and alien tissue, and emerges the same distance away from the new-growth opposite the point of entry. Now the tissue to be excised has been pinned, and it will not be lost when the skin is incised, unless one carelessly cuts or pulls out the guide sutures.

The next step is quite important to observe. A straight incision definitely *is not made*; rather, the incision begins outside one of the extremities of the guides, swings about in a gentle curve to a comparable point beyond the opposite extremity, then returns in a like manner on the opposite side to the starting point. This elliptical incision is now deepened into the fat. Tension is now placed on the guides, elevating the whole mass out of the wound as the dissection proceeds. Any cancer

cells which have been carried into the tissues by the needles lie safely in the block of tissue to be removed. One continues to exert tension on the guide sutures. This, in a fashion turns the wound inside-out, and such tendency is maintained during the entire procedure. The tissue being attacked may now be boldly, cleanly, and quickly excised.

One notes at once that during the process of dissection, as one draws upon the tension sutures the increasing depths of the wounds continue to approach the surface. The bleeders are always in full view and easily subjected to clamping and ligation. The wedging incision is nicely carried under the tumor. By the time the last firmly holding attachments at the base are reached, all

of the bleeders have been clamped, and, if the surgeon desires, already ligated. This last firm strand is caught with a hemostat, and the tumor separated from the breast tissue. Every recess of the dry, wedge-shaped wound is easily inspected. After ties are placed, the sides of the wound are approximated with "000" plain catgut and the skin with silk. The resulting wound presents a fine scar without indentation.

The above outlined method allows one to conclude the operation with dispatch. It is offered to the reader in the hope that some part of it may be of assistance to him in simplifying an operation which on occasion seems to offer more difficulty than it should.

CHORIONEPITHELIOMA

(Continued from Page 402)

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Continuation Studies

Conjunctivitis

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EXCEPT for the cornea, the conjunctiva is the most exposed part of the eye. It is subject to infections both bacterial and viral; it shares in that peculiar tissue reaction known as allergy; it is subject to trauma. These are the etiologic factors in conjunctivitis. The types of conjunctivitis can be differentiated clinically and are amenable to different forms of treatment. In addition, conjunctivitis occurs as a part of or during the course of many systemic disorders.

Infective Conjunctivitis

Bacterial Conjunctivitis

Bacteria are the commonest etiologic factors in conjunctivitis. While the conjunctival sac is sterile at birth, a short time later various bacteria can often be cultivated. The common saprophytes are *staphylococcus albus* and diphtheroids.

Factors in preventing pathogenicity are: (1) the low temperature of the conjunctival sac, (2) the flow of tears, and (3) the presence in tears of the bactericidal enzyme lysozyme which rapidly and completely dissolves many airborne saprophytes. Lysozyme, plus certain other undiscovered factors, has the property of inhibiting growth of many ordinary pyogenic cocci, such as, the staphylococcus, hemolytic streptococcus and pneumococcus.

1. *Acute Primary Conjunctivitis*.—Many types of acute bacterial conjunctivitis have been described on a basis of the clinical course of the disease. It is best to lump these cases simply as acute primary conjunctivitis. The clinical picture shows the usual signs and symptoms of inflammation. The conjunctiva is red, especially in the fornices, and it may be edematous, sometimes so much so that it rolls over the cornea. There is usually no pain, but the patient often complains of a scratchiness or a foreign-body sensation. The

discharge present is muco-purulent. In the acute stage the discharge is sufficient to glue the eyelids shut overnight, and when the patient is seen is usually adherent to the lashes and lying in the conjunctival sac.

Organisms Causing Acute Conjunctivitis.—Staphylococci have become by far the commonest causative organism in acute bacterial conjunctivitis.¹ Pathogenic staphylococci may be differentiated in the laboratory from nonpathogenic strains by their ability to ferment mannitol² and by their proliferation of a coagulase.³

CAUSATIVE ORGANISMS

Staphylococcus	or rarely
Hemolytic streptococcus	Gonococcus
Pneumococcus	Koch-Weeks bacillus
	Influenza bacillus
	Meningococcus
	C. Diphtheriae
	And many others

Treatment of Acute Bacterial Conjunctivitis.—In the vast majority of cases acute conjunctivitis is a self-limited disease. The action of the lysozyme, the mechanical washing by the tears, and the natural defenses of the conjunctiva will successfully control the infection in a few days. Cleansing the conjunctival sac by irrigating with saline or Metaphen 1:2500 solution every hour or so should be advised, with special attention to the secretions which tend to accumulate on the eyelashes.

If the infection seems more severe, one of the sulfonamids may be prescribed for local use as an eye drop. Gantrisin 4 per cent or Sodium Sulfacetamide 30 per cent are suitable, as they rarely provoke an allergic reaction.

Solutions of the antibiotics should not be used routinely except in severe conjunctivitis for the following reasons: (1) Many people develop an allergic reaction, particularly to penicillin. (2) Ocular use of the drug may sensitize the patient making its use impossible for more serious in-

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fections. For this reason, if antibiotics are to be prescribed for local use in the eye, one of those not commonly used systemically should be the drug of choice, e.g., bacitracin or polymixin. (3) There is an increasing incidence of bacterial resistance to the antibiotics. Staphylococci, the commonest offending organism in conjunctivitis, is also the bacteria which most readily develops resistance to antibiotics. Most series report well over 40 per cent of staphylococci resistant to penicillin.⁴

Enthusiastic purists in the field of ocular bacteriology have suggested that cultures should be taken to determine the offending organism in each case of ocular infection before treatment is begun. Since most cases of acute conjunctivitis are self limited, cultures may be reserved for severe and resistant cases.

Some don'ts are as important as the do's in the treatment of acute conjunctivitis.

1. Do not put a patch over the eye. This increases the temperature in the conjunctival sac and dams back the secretions providing the bacteria with better growing conditions.

2. Do not prescribe ointments for daytime use. They are annoying to the patient because they blur his vision and the cleansing action of drops is beneficial.

3. Do not tell the patient to put the drops in his eye "occasionally" or "three times a day." Drugs placed in the conjunctival sac are diluted by the tears very rapidly, especially in the epiphora of conjunctivitis. If drops are prescribed, they should be used every fifteen to thirty minutes the first day, then reduced to every one to two hours the second day if the condition has improved.

The patient should be reminded that conjunctivitis is contagious, so that he will not touch his other eye and will avoid spreading it to others in his family. Children should remain home from school for the short time necessary to cure the disease.

Ophthalmia Neonatorum.—The *staphylococcus* is also the commonest cause of conjunctivitis of the newborn. Treatment is as described above.

Gonococcic conjunctivitis of the newborn, now fortunately rare, begins twenty-four to forty-eight hours after birth. It is characterized by extreme edema of the conjunctiva and lids, a profuse dis-

charge turning purulent after a few days and early corneal involvement if untreated.

In treatment of gonorrheal ophthalmia, good nursing is essential. The discharges should be carefully removed from the eye every thirty minutes. At the beginning of treatment and daily if necessary, two drops of 1 per cent silver nitrate should be instilled in the eye, followed in a minute by saline irrigation. Instillation every fifteen to sixty minutes of drops of one of the newer wide-spectrum antibiotics which affect the gonococcus, such as Aureomycin, should be begun. It is essential to keep the seropurulent discharge irrigated from the eye to prevent corneal damage.

Inclusion conjunctivitis in the newborn (inclusion blennorrhea) is caused by a *virus* which inhibits the female genital tract and may cause a conjunctivitis in the newborn. This conjunctivitis resembles gonococcic conjunctivitis just described but does not appear until five to seven days after birth. The lid swelling and chemosis are less severe than in gonococcic conjunctivitis and the secretion, instead of becoming profuse and purulent, becomes scanty.

In the adult, infection occurs after swimming in pools not properly disinfected. The infection resembles that due to bacteria except that the preauricular lymph node is frequently swollen. Both in adults and newborn the disease subsides under treatment with sulfonamides.

Silver nitrate reaction sometimes gives the appearance of a mild acute conjunctivitis twenty-four to forty-eight hours after birth. Bacteriologic examination provides positive differentiation.

2. *Secondary Bacterial Conjunctivitis.*—In this category are placed repeated subacute infections of the conjunctiva from a source near the eye.

(a) *Conjunctivitis secondary to upper respiratory infection* requires treatment of the general condition for complete cure.

(b) *Conjunctivitis secondary to dacryocystitis.* Chronic dacryocystitis should be suspected as a cause of conjunctivitis in children and in the aged. The diagnosis is made by expressing pus from the tear sac. In recent years, a high proportion of these cases have been complicated by infection with Gram-negative organisms;⁴ therefore, treat-

ment should be controlled by a determination of the offending organisms and their sensitivity to the various drugs. There is almost always obstruction of the nasolacrimal duct so referral may be necessary for restoration of tear drainage before a cure can be accomplished.

(c) *Angular conjunctivitis* is the name given to a type of conjunctivitis due to the *Bacillus Moraxella lacunata*, a Gram-negative bacillus of the hemophilus group. This germ typically inhabits the transitional epithelium at the inner and outer canthi and causes a maceration, excoriation and cracking of the skin at the outer canthus with a localized conjunctivitis in that area.

Treatment is with zinc sulfate 0.5 per cent drops to the conjunctiva and zinc sulfate 0.5 per cent or Chloromycetin 1 per cent ointment rubbed into the area of broken skin.

(d) *Conjunctivitis Secondary to Chronic Blepharitis*. Chronic blepharitis is a very common disease. It is always accompanied by a conjunctivitis and both are subject to acute exacerbations. The squamous type of chronic blepharitis is characterized by redness and thickening of the distal 2 m.m. of the eyelids. Large greasy scales resembling dandruff are firmly fixed to the base of the cilia. Squamous blepharitis is caused by seborrhea.

The ulcerative type of blepharitis shows the above picture plus shallow ulcers at the base of the cilia. It is due to seborrhea plus superimposed infection usually by staphylococci. The accompanying conjunctivitis is apt to be more severe in ulcerative blepharitis.

In both types of blepharitis, the patient should be treated by frequent shampoos followed by application of selenium sulfide suspension 2.5 per cent (Selsun). The crusts should be removed from the eyelid margin by scrubbing with water or Zephiran solution 1:3000. Applications of ophthalmic ointment yellow oxide of mercury 1 per cent—salicylic acid 1 per cent to the eyelid margin at bedtime are helpful.

In ulcerative blepharitis an attempt to eradicate the staphylococci by use of an indicated antibiotic for a limited period is advisable. A solution is used for frequent instillation during the day and an ointment rubbed into the eyelid margin at bedtime.

Virus Conjunctivitis

Many viruses may cause an acute conjunctivitis. Usually the diagnosis is made by absence of bacteria from the culture taken in a resistant conjunctivitis. Many of the virus diseases are accompanied by pre-auricular lymphadenopathy.

1. *Herpes simplex virus* may cause an acute severe keratoconjunctivitis in addition to the more usual ocular forms, namely, dendritic keratitis, disciform keratitis and vesicular lid eruptions.

2. *Epidemic keratoconjunctivitis* is characterized by an acute onset of follicular conjunctivitis and sometimes pseudo-membrane formation. Most cases have enlarged and tender pre-auricular lymph nodes. The cornea shows multiple small round infiltrates, subepithelial, which persist for many months. The acute disease heals itself in three to six weeks.

3. *Molluscum contagiosum conjunctivitis*. A large virus causes a skin lesion consisting of single or multiple papules which are pearly gray in color, with a central depression from which can be squeezed a caseous plug. When these lesions occur on the eyelid, they cause a conjunctivitis. Treatment is excision or cautery of the lesions of the eyelid.

4. *Common wart* (verruca). A common wart on the eyelid margin can cause a subacute conjunctivitis.

5. *Measles* (morbili). An acute catarrhal conjunctivitis typically accompanies measles. Koplik spots may appear on the conjunctiva.

6. *Trachoma* in many parts of the world is a very common eye disease and a serious cause of blindness. In the United States, it is found in certain states and among the American Indians. It is rare in Minnesota.

Characteristically, the disease causes a follicular hypertrophy of the upper tarsal conjunctiva. A pannus (vascularized scar tissue) of the upper half of the cornea occurs later, and scarring of the conjunctiva of the upper cul-de-sac. The diagnosis can be made in the laboratory from epithelial scrapings and material expressed from the follicles in which the typical inclusion bodies will be demonstrated. Treatment is oral and local sulfonamides.

7. *Inclusion conjunctivitis* (inclusion blennorrhea, swimming, bath conjunctivitis).—Inclusion conjunctivitis is seen either as an acute papillary conjunctivitis in the newborn already discussed, or as a subacute follicular conjunctivitis in the adult, with moderate discharge. There is usually pre-auricular adenopathy. The diagnosis can be made by demonstrating the inclusions in conjunctival smears and scrapings. Treatment is sulfonamides locally. The adult type will subside in two to three weeks without treatment or scarring.

8. *Lymphogranuloma venereum* can cause a conjunctivitis with pre-auricular lymphadenopathy.

9. *Acute follicular conjunctivitis of Beal* is an acute follicular conjunctivitis with pre-auricular lymphadenopathy and spontaneous healing. No corneal complications occur.

10. *Cat Scratch disease*. An interesting disease consisting of conjunctivitis, pre-auricular adenopathy, malaise and fever following a scratch on the face by a cat has been described by many authors the past few years.⁵ It is thought to be due to a virus or to leptothrix infection.

Allergic Conjunctivitis

The allergic conjunctivides are characterized in general by: (1) The outstanding symptom is itchiness in contrast to the "pricking" or "pain" or "foreign body sensation" of infective conjunctivitis. (2) The congestion of the blood vessels is less marked, but there is a greater tendency to edema of the conjunctiva, especially near the limbus. (3) Characteristically the discharge is scant and tends to be ropy and tenuous.

Simple allergic conjunctivitis is well known as the ocular portion of the hay fever syndrome. It can, of course, occur without the general manifestations of hay fever.

In addition to the well known allergens, such as foods, pollens, dust, things to be kept in mind in investigating a case of allergic conjunctivitis are cosmetics and medications being instilled into the eye. In this latter connection, pilocarpine, eserine and the antibiotics deserve special mention. The incidence of allergy to the antibiotics among the general population is striking. It has been estimated that up to 10 per cent of the

general population is allergic to penicillin, or at least shows allergic manifestations when it is used topically. Pilocarpine and especially eserine deserve mention because many patients with glaucoma, after using these drugs for years, develop a chronic conjunctivitis characterized by follicles on the conjunctiva of the fornices. Pilocarpine will also cause a more acute allergic reaction, as will pontocaine, butyn and most medications.

Allergic conjunctivitis is frequently accompanied by an *allergic dermatitis of the skin of the eyelids*, particularly in allergies to medications being used in the eye and to cosmetics. Additional etiologic factors in allergic dermatconjunctivitis are eyeglass plastics and metals, fingernail polish, detergents and soaps and other things that may be rubbed by the fingers onto the eyelids.

Treatment of allergic conjunctivitis should first of all be directed toward finding and eliminating the allergen if possible. Relief of the local symptoms may be obtained by use of steroid suspensions locally and by use of the antihistamines locally or by mouth.

Vernal catarrh is the name given to a special type of allergic conjunctivitis, occurring in the warm weather. It is characterized by the above described signs of allergic conjunctivitis—itching, edema, thick mucous discharge—plus two special types of reactions.

In the limbal type of vernal catarrh, there is a gross edema and hypertrophy of the conjunctiva near the limbus so that a regular doughnut of conjunctiva rises and overhangs the cornea. This hypertrophied conjunctiva is grayish-pink in color.

In the palpebral type there occur large soft grayish-pink granulations on the tarsal and fornix conjunctiva, especially that of the upper tarsus, which are flattened and packed together in angular shapes to present a cobblestone appearance. These cause the patient great distress and in severe cases, they may persist and be present all year 'round.

The etiology of this condition is still uncertain. It usually affects boys and young men ages six to twenty. The precipitating factor may be pollen or it may be the warmth of the spring. Emotional factors may also play a part.

Treatment has been much more effective in relieving the symptoms of these very distressed patients since the advent of steroids; suspension hydrocortisone 0.5 per cent locally is used. It

is usually necessary to begin treatment each year at the onset of symptoms and persist until fall. In addition, these patients obtain relief of symptoms if the stringy mucous is removed from the upper tarsus manually or by irrigations. Like so many allergic disturbances, this disease tends to recur for many years, then burn itself out.

If the follicles in the upper tarsus are very large, it may be necessary to remove them, or reduce their size. The preferred method is two or three applications of the *B*-rays of radium. Enough should be used to relieve the symptoms. It is not always necessary to remove the granulations entirely.

Vernal catarrh is common in Minnesota.

Phlyctenular keratoconjunctivitis is not common. This disease is an allergy to tuberculo-proteins and occurs in undernourished children who have a primary tuberculosis complex in their hilar nodes. It is characterized by raised nodules in the bulbar conjunctiva, surrounded by a zone of hyperemia. The nodules break down and form ulcers. They also occur on the cornea where they are accompanied by a leash of vessels from the limbus.

While tuberculo-proteins are thought to be the usual precipitating allergen, other bacterial and viral proteins, notably the proteins of *Staphylococcus aureus* when marginal blepharitis is present, can cause phlyctenular conjunctivitis.

The treatment of choice is hydrocortisone locally and improvement of the child's environment.

Traumatic Conjunctivitis

Trauma must not be forgotten as a possible etiologic factor in conjunctivitis. In acute conjunctivitis, the possibility of foreign body or chemical burn should be investigated. A foreign body in the eye for a few minutes then rubbed or flushed out will leave the conjunctiva congested for several hours, with lachrimation and perhaps a mucous discharge.

Chronic Conjunctivitis

(Generalized Hyperemia Without Secretion)

There are many people whose eyes are constantly a little congested, who occasionally or always have more secretion of mucus than usual, whose eyes water unusually easily, and who come to the doctor detailing such symptoms. They usually are given to using their eyes for prolonged

periods of close work, such as reading. A number of factors singly or in combination must be considered in the etiology or in combination must be considered in the etiology of chronic conjunctivitis.

Bacterial infection, particularly staphylococcal infection, tends to become chronic with the organisms residing in the glands of the eyelid and chronically affecting the conjunctiva, probably through allergy to the bacterial proteins and toxins.

Allergy.—In addition to bacterial allergies, chronic exposure to such allergens, as cosmetics or house dust may bring a very mild chronic response in some individuals.

Trauma and irritations frequently either cause or aggravate chronic conjunctivitis. Dust in industrial situations and tobacco smoke are two common factors of this sort.

Refractive errors may also be a factor contributing to the hyperemia. Also a related factor is the prolonged use of the eyes in substandard illumination.

Patients with chronic conjunctivitis have to be examined and questioned carefully to evaluate which one or combination of these etiologic factors is the cause. Treatment should be directed against the causative factor, but it should take the simplest form, because these patients probably will always have slightly red eyes and may go on using any given prescription for years.

Antibiotics should never be used for chronic conjunctivitis. If any element of infection is present Metaphen 1:2500, Merthiolate 1:5000, or Aqueous Zephiran 1:5000, in drop form, for use four times a day may be prescribed.

Instruction in general eye hygiene is helpful; for example, these patients should be told not to rub their eyes. They should be cautioned to read in good light and to rest occasionally. A useful prescription to be used in an eye cup three times a day or as needed is:

Sodium Bicarbonate	
Sodium Biborate.....	1/0
Rose Water.....	30/0
Distilled Water.....	180/0

Eye drops for prolonged use in chronic conjunctivitis should not contain pontocaine, holo-

caine or other local anesthetics. There is the danger of sensitization, but a greater danger is that of a foreign body lodging in the eye for a long period while the eye is anaesthetized.

Conjunctivitis in Systemic Disease

1. *Acute Exanthemata*. As is well known, conjunctivitis, usually acute in nature, constantly accompanies measles. It can also occur in association with the skin lesions in German measles, in influenza and in most of the acute exanthematous diseases of childhood. The lesions of chicken pox, small pox and even vaccinia commonly occur on the lids and may involve the conjunctiva.

2. *Diphtheria*, already described under membranous conjunctivitis, may occur primarily or secondarily in the conjunctiva.

3. *Parinauds Syndrome*. Several diseases can cause an ulcerative granulomatous conjunctivitis with pre-auricular adenopathy. The disease and the tests necessary to differentiate them are:

Disease	Diagnostic Procedure
Lues	Serology; dark field
Tuberculosis	Smear—Culture
	Guinea pig inoculation
Lymphopathia Venereum	Frei test
Tularemia	Agglutination test
Leptothricosis	Histologic examination of nodules.

4. *Trichinosis*. The first sign may be a redness and edema of the conjunctiva. This disorder is resistant to treatment and the diagnosis may be suggested by excessive soreness on moving the eyes, the extraocular muscles being involved like the other muscles of the body.

5. *Thyrotrophic* disorders might be kept in mind in any usual disorder of the conjunctiva. Early exophthalmos may be unnoticed and the exposure causes conjunctival edema and redness.

6. *Keratoconjunctivitis Sicca* (Sjogren's syndrome) consists of deficient secretion of the lacrimal, salivary and sweat glands, and arthritis, and it occurs in women past the menopause. These patients complain of burning and irritation of their eyes. Also the cornea lacks lustre, and tags of epithelium like short filaments may have

rolled off it. The lack of tears may be detected by *Schirmer's test*. A strip of filter paper 5 m.m. by 35 m.m. is bent so that 5 m.m. hangs inside the eyelid. In five minutes 15 m.m. of the rest of the filter paper should be wet.

Treatment is by artificial tears, 0.5 per cent or 1 per cent methyl cellulose, as needed.

7. *Acne Rosacea* causes a conjunctivitis, but the main eye lesion is a corneal infiltration and vascularization.

8. *Pemphigus* is a rare, acute or chronic, and usually fatal disease characterized by a generalized eruption of bullae. In acute pemphigus, there is a sudden onset, a rapid course to death. On the conjunctiva, as elsewhere on the skin and mucous membranes (throat, mouth), hemorrhagic or purulent bullae arise on previously normal tissue.

Chronic pemphigus vulgaris is more common.

Chronic ocular pemphigus occurs with or without lesions in the mouth and throat and without skin changes.

The cause is unknown, possibly it is a virus.

8. *Erythema multiforme bullosum* is an acute inflammatory disease, characterized by sudden onset of eruptions of many forms, including large bullae surrounded by red halos. There are also bluish red macules, papules and bullae. The duration is short and the prognosis good. Conjunctivitis accompanies it and may be catarrhal, purulent or a severe destructive membranous conjunctivitis causing extensive scarring and even loss of the eye. The ocular form of the disease is called Stevens-Johnson disease. The cause may be a virus or the disease may be a toxic reaction to a drug, such as sulfonamides.

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Gout: A Metabolic Disorder

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THE major problem of gout in clinical medicine today is its recognition. Present therapy is sufficiently effective to relieve almost every sufferer from gout.

Isotope studies have enlarged our knowledge of uric acid metabolism in man but the basic abnormalities are still unclear. Patients with gout have greatly increased miscible pools of uric acid in their bodies in addition to their increased serum levels of uric acid. The cause of this increase is probably due to overproduction of uric acid, rather than the alternatives of decreased breakdown or diminished urinary excretion of uric acid. The normal source of most of the body's uric acid is from protein, and especially nuclear metabolism, plus ingested purines. However, it has recently been shown that the body can form uric acid from such elementary substances as glycine without the intermediate formation of nucleic acid.

Diagnostically, the history of acute recurring attacks of joint pain, with a predilection for the feet, is the most valuable feature that differentiates gout from other forms of arthritis. Typically the attacks are sudden in onset, monarticular, disabling for several days to a week or two and then followed by complete remissions. In its late stages gout may be indistinguishable clinically from rheumatoid arthritis, but the early distinguishing history can and should be elicited.

Tophi, which represent gross deposits of sodium urate crystals, are not early findings but are present in almost 20 per cent of patients in collected series of gout. Serum uric acid levels above 6 mgs. per cent are usual. Occasionally normal levels are found, especially if the patient has taken salicylates in some form for pain relief. Hyperuricemia alone does not justify a diagnosis of gout: leukemia, polycythemia vera, renal insufficiency and certain skin disorders may be responsible. Bone x-ray changes, consisting of punched-out areas and representing osseous tophi, are a relatively late finding. Of great diagnostic significance is the dramatic response of the acute

gouty attack to colchicine. No other type of arthritis will respond in this manner, but therapy must be prompt and adequate.

Colchicine still is the most usual treatment for acute gouty arthritis. The following is the schedule employed:

1. Colchicine (grains 1/100), two tablets for the first dose followed by one tablet every two hours until pain is relieved or gastrointestinal upset occurs.
2. Purine free diet.
3. Liberal fluid intake.
4. Strict bed rest during the attack.
5. Hot or cold applications to the affected joints.
6. Uric acid diuretic and alkali.

Intravenous colchicine is now available and is especially valuable where severe gastrointestinal intolerance prohibits oral medication. Its action is also more rapid. Two to three milligrams is the usual dose, and one to three milligrams may be given as a second dose if relief is not adequate after several hours.

Butazolidin is a very effective drug in acute gout, and has the advantage over colchicine of not causing intestinal upset. An initial dose of 400 mg. can be followed by 200 mg. every two to four hours with expected dramatic relief in six to twelve hours, when the dosage can be greatly reduced.

Treatment during the interval between acute attacks represents a much neglected phase in the complete care of the patient with gout. The aim is to prevent attacks of gouty arthritis and to prevent the deposition of urates in the joints, the kidneys and other tissues. Many patients with severe chronic gout can be restored to normal function if the following program is carefully carried out:

1. Low purine diet.
2. Avoidance of individual provocatives.
3. Urate diuretic with alkali.
 - (a) Aspirin—4 to 6 gms. a day—usually on only three to five consecutive days of each week.
 - (b) Benemid—1 to 2 gms. per day.

(Continued on Page 439)

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Case Presentation

Hypofibrinogenemia

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THIS case is presented as an example of typical hypofibrinogenemia.

Case Report

Mrs. R. H., thirty-five years old, was a Para IV, Gravida VI, with two living children. Her last normal menstrual period was April 1, 1954, making the expected date of confinement January 7, 1955. Her first visit to the Mankato Clinic occurred on June 2, 1954, at which time she was eight and one-half weeks' pregnant. Physical examination confirmed the findings of pregnancy in a parous female, and the usual laboratory work was performed, and found to be essentially negative. The patient was a known Rh-negative isoimmunized individual, having had one previous stillborn, macerated infant, due to erythroblastosis foetalis.

A summary of her obstetric history disclosed that she had delivered a normal male infant in January, 1947. The patient at that time was known to be Rh-negative and the husband to be Rh-positive. No immunity was found.

Her second pregnancy was in May, 1949, at which time she delivered a normal living male infant, following a prolonged labor due to a brow presentation. There was a retained placenta which was removed manually. During this pregnancy the patient's Rh titer was obtained, and she was not immunized.

In August, 1951, the patient was delivered of a viable male infant, who required considerable resuscitation probably because of a tight cord around the neck. There was no evidence of Rh-isoimmunization.

Her next pregnancy occurred in August, 1952, at which time she was delivered in the seventh month of a macerated female foetus. There was evidence of Rh-isoimmunization with a titer of 1:526 (albumin anti-D).

In 1953, the patient had a spontaneous miscarriage during the third month of pregnancy. There was evidence of Rh-isoimmunization at that time with a titer of 1:500.

At the time of the first obstetric visit, in June, 1954, an albumin antibody titer of 1:512 (anti-D) was found. On August 10 the patient first noted foetal movement. Weight gain, blood pressure, and urinalyses up to this time were within normal limits. Foetal heart tones were heard by the examiner on October 19. By October 25, no further heart tones were heard and the patient had noted no movement for about three days.

A roentgenogram of the abdomen was taken November 1, 1954, at which time there was some evidence of

collapse of the foetal skull bones, suggestive of foetal death. On November 8, a repeat Rh antibody titration was taken, showing a blocking albumin titer of 1:1024 with a negative saline titer. Confirmation of this titration was obtained by Dr. Philip Levine of Raritan, New Jersey.

Toward the end of November the patient noted skin itching, and on physical examination there seemed to be some diminishing size of the uterus, as measured from the symphysis pubis to the fundus.

On December 18, during the absence of this patient's family physician, she was admitted to the hospital because of bright red vaginal bleeding. By dates, she was by this time in her thirty-eighth week of pregnancy; the size of the pregnancy, however, was of a twenty-eight to a thirty-week gestation. A clotting time, done in the office, one week prior to admission, failed to show evidence of coagulation and retraction of the clot after one hour. Because of this, afibrinogenemia was suspected in this Rh-isoimmunized mother having a high antibody titration, associated with foetal death *in utero*.

Immediately upon admission to the hospital, a Lee-White coagulation time was obtained. This specimen finally clotted at the end of seventy-two hours. Whole fresh blood was obtained from the Red Cross unit and heparinized live-donor blood was used as much as possible. Seven donors were bled, and five additional citrated blood samples were cross-matched and made available for the patient. Her blood grouping was Group A Rh-negative. During this time only minimal bleeding was evident, and the University of Minnesota was contacted in an attempt to obtain samples of fibrinogen. Three grams were made available commercially by Cutter Laboratories and were sent to Mankato by Highway Patrol.

As labor progressed, bleeding became more brisk, and towards the end of the first stage of labor, the first fibrinogen supplies were administered to the patient. After administration of three grams of fibrinogen, the patient's blood coagulation time was one and one-half hours by the Lee-White method. Meanwhile, the American Red Cross shipped from Lansing, Michigan, five units of fibrinogen manufactured by them under their fractionation program.

Blood transfusions were started as soon as the bleeding became a problem, i.e., during the second stage of labor. A macerated, stillborn, foetus was delivered spontaneously without laceration of the perineum, during the evening of December 18, 1954. At the time of separation of the placenta bleeding became massive; transfusions were started in both arms and in one leg, and we were still unable to maintain blood pressure

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within satisfactory limits; the patient rapidly went into shock. Two more units of fibrinogen were made available through Cutter Laboratories from the University of Minnesota and were administered as soon as they arrived. However, at this time there was so much bleeding that the clotting time did not improve. In fact, from its previous one and one-half hour determination, it had risen to two and one-half hours. During the hemorrhagic episode, continuous ecbolics were administered in the form of intravenous pituitary extracts (Pitocin); Vitamin K and ascorbic acid were also administered, and calcium gluconate was given at the rate of one ampule (one-half gram) for every three pints of citrated blood. During the ensuing eight hours, twenty-eight pints of whole blood were given, of which seven were fresh heparinized blood and the remainder citrated bank blood from the American Red Cross. Co-operation by the Red Cross blood bank agencies was remarkable, and shipments were obtained by air from as far away as Washington, D. C.

Bleeding, however, continued because of lack of fibrinogen, and at 5:00 a.m., December 19, 1954, a supracervical hysterectomy was performed because we were no longer able to maintain this patient out of shock. Because of the afibrinogenemia, there was a large amount of oozing from all cuts and peritoneal surfaces. During surgery blood pressure improved from the shock state of 26/0 to 120/65, and the patient was returned to her room in good condition.

Two hours after hysterectomy, the fibrinogen from Lansing, Michigan, arrived. It was administered to the patient with resultant lowering of the coagulation time by the Lee-White method to seven minutes and twenty seconds. The total amount of fibrinogen administered during this second infusion was 4.6 grams, making a total of 10.6 grams. We did a few experiments with blood that had been drawn during her acutely anticoagulant stage. One drop of fibrinogen added to a specimen of that blood caused instant clotting.

Postoperatively, this patient did amazingly well. Examinations of the urine on the following day showed four to five white cells per high power field but no red cells on catheterized specimen. However, there was a considerable quantity of albumin in the urine and that remained present until December 29, eleven days postpartum.

On December 31, a Fishberg urine concentration test was performed, and a specific gravity of 1.024 was obtained. P.S.P. excretion test showed 88 per cent excretion at the end of the third hour, 46 per cent being excreted in the first half hour. Lee-White coagulation times remained within normal limits from December 19 onward, and the patient was discharged the hospital January 3, 1955, the sixteenth hospital day, the fifteenth postpartum day, and the fourteenth postoperative day. The wound had healed *per primam* and follow-up examinations of this patient during the ensuing year and a quarter had been completely normal as far as her pelvis was concerned.

Exactly twelve weeks after her episode of bleeding, the patient was seen with evidence of clinical jaundice,

and a diagnosis of homologous serum jaundice was made. This condition responded well to conservative management, and at the present time this patient is alive and well.

During her entire hospital stay, a total of thirty-eight pints of blood were administered. All of these were Group A Rh-negative and all cross-matched satisfactorily with the patient. All were obtained through the services of the American Red Cross, either as live donors from the Red Cross list, or from bank blood supplied by the Red Cross.

Discussion

In 1950 and in 1951 blood clotting mechanisms as causes of postpartum hemorrhage were reviewed by several groups of workers. All of these people discovered that hemorrhage, being a main cause of maternal mortality in our time, was often associated with defects in the clotting mechanism chemistry. Work by Schneider and his co-workers¹ showed that fibrin alone can be formed and disseminated throughout the circulatory system and that this fibrin can be produced by the induction into the circulation of a trigger substance, i.e., thromboplastin.

Further work by this same group^{2,3} has shown, at least in experimental animals, that crushing the intact placenta can produce this "fibrin embolism" by introducing thromboplastin into the circulation.

The fibrin emboli have been shown to be trapped in the lungs, kidneys, brain, certain mesenteric vessels, and other vital areas of the body. It was postulated by Weber and Paxson⁴ that this defibrination of the blood—in certain cases of abruptio placentae, degeneration of a dead foetus *in utero*, and even in partial abruption with prolonged labors—might be due to the same mechanism of thromboplastin infusion, lowering the fibrinogen content of the blood to a point where clotting defects become obvious.

Kinch and his co-workers⁶ in Toronto studied the fibrinogen levels in normal pregnancy and found that the average level at delivery was 325 milligrams per cent. The range of normality according to duration of gestation showed that early in pregnancy, about the eighteenth week, fibrinogen levels were about 275 milligrams per cent, rising gradually to a maximum, about the thirty-second to thirty-fourth week, to 455 milligrams per cent, and dropping at term to the 325 average. This follows closely the total protein levels which have been investigated by previous

workers. Animal experimentation has shown that amniotic fluid, foetal and placental extracts, are rich in thromboplastin and are capable of reproducing the syndrome of extensive intravascular defibrination. In certain cases of hypofibrinogenemia, especially those associated with intra-uterine death, such as our case, a circulating fibrinolysin has been reported. It has been postulated that this fibrinolysin is present as an attempt by the body to keep the circulation free of clots. However, the entire picture of the etiology of this syndrome remains controversial.⁵

Perhaps the best review article on the management of afibrinogenemia is that by Weber and Paxson in the Philadelphia Symposium Number of the Surgical Clinics of North America, December, 1954.

Conclusions

In our experience, with three cases of hypofibrinogenemia, we have obtained our best results when the condition was diagnosed early, and when treatment was begun prior to the anticipated hemorrhage, i.e., prior to the third stage of labor. We suspect blood clotting defects now with any case of placental abruption, any case of foetal death *in utero*, or any case of unusually prolonged labor, and even in cases of missed abortion. Any physician can perform a Lee-White clotting time determination in his office without complicated equipment. The Fibrindex* Test is a simple

office procedure, which requires only a stop watch and a couple of test tubes.

It would seem, early diagnosis being so important in this type of condition, that failure to do these blood clotting studies in a case of abruption, foetal death *in utero*, and missed abortion, would almost constitute negligence.

It is my belief that hypofibrinogenemia is not a rarity, but that its accurate diagnosis is a rarity. I further feel that with more frequent hematologic studies varying degrees of this condition will be found more and more frequently as time goes on. This may point the way to lowering the maternal mortality rates from hemorrhage, making childbirth even safer than it has been in years past.

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(Continued from Page 423)

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Editorials

JOHN F. BRIGGS, M.D.
ARTHUR H. WELLS, M.D.
HENRY G. MOEHRING, M.D.

THE IOWA JOINT DECLARATION

The Joint Declaration of the Iowa State Medical Society and the Iowa Hospital Association (see Medical Economics section) concerning the practice of Pathology and Radiology in hospitals of that state is a compromise agreement which should result in improved service to the patient. The ideal arrangement, as already expressed in the present laws of both Iowa and Minnesota, can be accomplished only by a physician running the laboratory or radiology department independent of lay hospital administration but controlled in certain aspects by the medical staff. Under these circumstances, he would purchase and own the equipment; hire, pay and discharge the departmental technical personnel; probably rent the space for his practice from the hospital; and charge the patient jointly or separately from the hospital for professional services but always in his own name. This arrangement puts the burden of furnishing the best and most advanced laboratory service completely on the one individual most likely to accomplish the best results—a physician. In the long run of events, this form of private enterprise conducted for a profit by a person trained in the field of medicine was considered in the wisdom of the legislators of many of our states as the most likely to pay the highest dividends to the people of the state.

The Iowa agreement does promote some of the ideals mentioned above but appears to permit the hospitals to assume the major responsibility for the technical personnel and equipment used in the x-ray or laboratory services. A laboratory can be a great success or failure depending upon the quality of either of these aspects of laboratory management. A trial of this mixed responsibility related to two important fundamentals (technical help and equipment) is very likely to begin in the near future in Iowa.

STILL NO CASE FOR POLYGAMY

A man and his wife cannot be convicted of conspiring together since, for many legal pur-

poses, a man and wife are indeed one. This generality probably stems back to earlier than Biblical times, but gained a more formal status as English common law was encased in writing. We accept as axiomatic, then, that such a conspiracy does not exist in the eyes of the law, but now we come to these problems: With how many wives can a man safely conspire? Could a modern Solomon set up a many-splendored conspiracy, say in Arabia; visit the United States as a polygamous unit; and thus thrust into our community a ready-made conspiratorial racket (no matter of what sort) that the law couldn't bring to book? And should this come to pass, would it be better to fight 'em or to join 'em?

We had invested only speculation in exploring this legal loophole when our phantasy exploded. A usually reliable source of legal information handed down the opinion that if all spouses (whether two or two thousand) conspired to commit criminal offenses, they could be convicted of conjoined, and conjugal, "incitement." . . . Now such a simple solution to thwart what looked like a promising way to beat the law left us deflated, though not depressed. This sneaky legal countermove *did* rob us of endless conversational material, but our fears that someone *could* demonstrate an advantage to having a lot of wives are happily unfounded.

WHAT ARE BOOKPLATES?

The term *bookplate* does not convey at first any real idea of what one is, or for what it is used. No wonder some persons think it means a metal plate sunk into the cover of a rare book, and believe that the owner of an elaborate affair such as they imagine it to be must possess vast wealth.

A bookplate is a mark of possession, a small work of art in the general sense of the word, which is pasted into the owner's books, usually at the center of the front cover on the inside, by which

This is the first in a series of editorials on bookplates and their design.

his name is shown and moreover by which the owner tells what he enjoys.

This is done by means of a design of some sort. The design may be conventional or realistic, it may be simple or elaborate, it may be small or large. The simpler the design, the more effective it usually is. Let it represent one central idea such as an out-of-doors spot where you have spent a series of summers or one fleeting week; let it show a corner of your home, or the flower you love best, or if a more formal touch is wished, the family coat of arms.

In the early days of bookplates, about the year 1500 in England, the coat of arms was most generally used on bookplates because this type of design was used to mark practically everything owned by the family. In these days, we are not limited for any such reason and are free to use whatever we choose. People everywhere in the world seem to have found that a bookplate is a charming thing to own and that it will almost invariably bring a book back to its owner.

The oldest known bookplate is estimated to have been made in Germany about 1450, before Columbus discovered America. From Germany, the use spread to England, to France, and finally to all continental countries. In England, the oldest example was that used by Cardinal Wolsey. Its approximate date is 1520. This was a hand-drawn plate and may still be seen in a folio volume belonging to Wolsey. The next oldest English plate (the first engraved plate) was made in 1574 for Sir Nicholas Bacon, affectionately known as "the father of his country and of Sir Francis Bacon."

The earliest French designs were seen about 1574, in Sweden about 1575, in Switzerland in 1607, all before the Mayflower sailed for our shores. Italy followed about 1623. This shows the antiquity of the bookplate and its gradual migration from one country to another.

CLEORA WHEELER

CONFESSIONS OF A HOBBYIST

Stamp Collecting

In 1892, an aunt presented me with a big Scott's Stamp Album. To this day, I can remember eagerly sticking in the first stamp—two-cent rose, United States of America, the issue without the triangles in the corners. The follow-

ing year, the big excitement was the Columbian issue. They were beautiful things, some of them hard to get, even at the post office. How I longed for the \$5-black—portrait of Columbus! Alas, I didn't have five dollars, and it was thirty years before I acquired a copy, for much more than five dollars. Of course I went through the usual small boy's sessions of trading, and buying penny stamps from approval sheets sent out by trusting dealers. Then stamps were laid away for twenty-five years.

In the early twenties, I had another severe attack of the disease. I got out the old albums, discarded copies mauled by small boy handling, and began to study watermarks and perforations. Extravagantly, I bought some occupants for empty spaces. The boarding house where I had been living closed, so I spent one spring term living alone in the Saint Paul Academy building, then far out in the country, and evening after evening I spread out and studied and mounted stamps. Somebody gave me a gunny-sack full of ordinary canceled two-cent stamps, and I examined every single stamp in the vain hope of finding one of those five-centers that were printed red by mistake.

I had one great philatelic thrill. I was in New York, and my friend, Theodore Steinway, invited me to go with him to the Collectors' Club, to see the Lichtenstein collection of British North America. At the head of the table was Mr. Lichtenstein, with an obsequious secretary, who slowly turned the album pages with a pair of small tongs, as we gazed with awe at beautiful, priceless specimens or early Newfoundland and Prince Edward Island stamps, many "on cover."

But one can't collect stamps without spending money, so I had to call a halt. Besides, I wanted hand work, and radio had appeared. The stamps were put away again. Ten years ago, I decided that they were one thing too many in a hobby-ridden house—that if I died and they were of any value, the inheritance tax people might get unpleasant, or some small grandchild would butcher the collection. So, reluctantly, I sold all but a few commemoratives which had been given me. The stamp collection became an aluminum canoe, a slide projector, and part of a Leica camera. I've had more fun out of all three than I ever had with the stamps.

JOHN DEQ. BRIGGS

CALENDAR HISTORY

The first type of calendar of which we have any historical record was called the luni-solar, devised by the Sumerians as early as 3500 B.C. It had twelve lunar months each with twenty-nine and one half days. This made a year of 354 days which was eleven days short of a true solar year. An extra month was added every third year to make up the difference. A variation of this year was adopted by the Jews and is still used as the basis of the Jewish religious calendar.

Along came the Babylonians. These ingenious people drove a stake in the ground to mark the shift of the rising sun and thus record seasonal changes. This calculation of time by seasons was all right for their uncomplicated life, but these early timekeepers were as far off as their predecessors. They, too, had to make an adjustment of eleven days each year. They threw in an extra month every now and then to bring the calendar up to par. This was mighty rough on the farmer and businessmen, but the tax gatherers must have gloated over the chance for extra levies. The Babylonians do get credit for the first system of numbering years, which they introduced in 1747 B.C.

Other experimenters with early calendars were the Mohammedans. They devised a strictly lunar calendar which is still in use today. Since it takes no account of the seasons or the sun, it is continually running fast. About thirty-three Mohammedan years equal thirty-two of our own calendar.

The Chaldeans narrowed the margin of error in about 500 B.C. to a mere half hour a year. They determined the length of the year to be 365 days, six hours, fifteen minutes and forty-one seconds—just thirty minutes too long.

The Egyptians then moved in on this knowledge. They added one day every fourth year making an average year of $365\frac{1}{4}$ days. This calendar was only eleven minutes in error.

Along came the Romans and Julius Caesar went to work on the calendar. His scientists worked out a year of ten months. This included Martius (31 days), Aprilus (29), Maius (31), Junius (29), Quintilis (31), Sextilis (29), September (29), October (31), November (29) and December (29). Later Januarius (29) and Februarius (28) were added.

This calendar accounted for 355 days. But the Romans improvised. A thirteenth month, Mercedonius, was inserted in the middle of Februarius every few years to correct the error. Since this addition was left to the discretion of officials, it was often used for political purposes to lengthen or shorten the term of office for public servants.

Julius Caesar realized the value of the calendar. He also recognized the weakness of the Roman system. To set things right, he boldly added ninety days to the year 46 B.C., thus making it a year of fifteen months and 445 days. This is known as the "Year of Confusion" and provided a field day for tax collectors and turned ordinary business upside down.

But the Romans were still not through monkeying with the calendar. Caesar had conquered Egypt and since Egyptian scientists were astronomically more accurate, Sosigenes, Cleopatra's most famous astronomer, was brought to Rome. He set up what is known as the Julian Calendar. He abandoned the lunar year and took the solar year of $365\frac{1}{4}$ days. The civil year was 365 days, with an additional day added each fourth year.

To honor Caesar's work on the calendar, the month Quintilis was changed to July. Along came Caesar's grand nephew Augustus and changed Sextilis to August to perpetuate his name. To make his month as long as July, he took a day from February and added it to August.

The Julian Calendar was much better than any in use before. It was still eleven minutes fourteen seconds wrong, and these pesky bits of time started piling up over the centuries.

JOSEPH H. SUMMERS
Brown and Bigelow

ALCOHOLISM IN INDUSTRY

Within the past decade, several large corporations have established rehabilitation programs for their problem drinkers. Among such corporations are Consolidated-Edison Company of New York, Eastman Kodak Company, E. I. DuPont de Nemours and Company, Standard Oil Company (New Jersey), and the Allis-Chalmers Manufacturing Company. The results obtained in these rehabilitation programs have been most gratifying.

One rehabilitation program that is being watched with much interest is the Consultation

This is the second in a series of editorials concerning calendar history.

This is the third in a series of four editorials on alcoholism in industry.

Clinic for Alcoholism at the University Hospital of the New York University-Bellevue Medical Center. This clinic was established in 1952 by Consolidated-Edison and several other major Eastern corporations for the treatment of alcoholic employees at a center located outside of the company setting. As reported in the June 30, 1956, issue of the *Journal of the American Medical Association*, 76 per cent of the 180 patients referred to this clinic have been able to remain on their jobs. This figure includes some employees who refused to accept treatment. Of those who accepted treatment, 82 per cent were rehabilitated. The absenteeism rate for employees treated at this clinic dropped from an average of fifteen days per year to an average of five days per year.

In an evaluation of its alcoholism rehabilitation program during a three-year period preceding the formation of this clinic, Consolidated-Edison estimated that the average annual loss to the company due to absenteeism and inefficiency caused by alcoholism was reduced from \$134,250 to \$65,450, a reduction of 49 per cent.

The rehabilitation programs mentioned above have received considerable nationwide publicity. Not so well known are the excellent programs of two national companies with headquarters in Minnesota. One of the outstanding alcoholism rehabilitation programs in the nation is that operated by the Great Northern Railway Company. The Great Northern alcoholism program is directed by two recovered alcoholics, a man and wife operating as a team to provide counseling service for alcoholic employees. Following this, employees are urged to join AA. If the employee is in need of hospitalization because of alcoholism, he is referred to whatever treatment resource seems most appropriate for him.

Since its beginning in 1950, the Great Northern program has been successful in rehabilitating 80 per cent of the alcoholic employees who have taken part in the program. What this means in terms of manpower saved, increased efficiency, and reduced training costs is readily apparent. Since 1953, the Great Northern has had the lowest accident rate per man hours worked of any major railroad in this country. The company feels that this low accident rate is at least in part attributable to the alcoholism rehabilitation program.

Another local alcoholism rehabilitation program of more recent development is that at Minnesota

Mining and Manufacturing Company. This program is conducted by the company's personnel department which makes extensive use of AA and other community social service agencies as referral sources. During the three-year period that the 3M program has been operating, 90 per cent of the alcoholics who have received assistance have been able to remain on their jobs.

Although the primary purpose of the 3M program has been the rehabilitation of alcoholic employees, an additional contribution has been the practical education of the families, clergymen, and supervisors who have taken an active part in the program.

Alcoholics who are employed and still have their homes, families, and community contacts are usually highly motivated to recover from their addiction. This factor accounts for the exceptional success of industrial alcoholism programs. It also emphasizes the importance of additional efforts to rehabilitate the alcoholic at this stage when his chances for recovery are still good.

PATRICK BUTLER, *Chairman
Minnesota Advisory Board
on Problems of Alcoholism*

GOUT: A METABOLIC DISORDER

(Continued from Page 432)

Alkali is given to increase the solubility of the excreted urates. Where sodium restriction is important one must rely largely on a high fluid output to prevent precipitation of uric acid crystals in the urinary tract.

The full co-operation of the patient is essential to the successful management of his gout. If he is adequately instructed as to the nature of his disease, and if he understands the reasons for the above measures, this co-operation usually is given gladly. He can then be followed at intervals of several months each, and his new-found physical well-being will be the best guarantee of his staying close to his gout regimen.

Current information indicates that there are somewhat less than 400,000 active tuberculosis cases in the United States at any one time, approximately one-third of which are hospitalized for tuberculosis, one-third are known cases at home, and one-third are undetected cases. ROBERT J. ANDERSON, M.D., *Public Health Reports*, February, 1956.

President's Letter

BETTER DISTRIBUTION OF PHYSICIANS

A better distribution of physicians throughout Minnesota has been an aim of the Minnesota State Medical Association and of individual physicians for many years. The well-known trek by industry and the professions toward urban centers has left many smaller communities without adequate medical and other professional care. Methods for correcting this maldistribution of physicians and for interesting younger men in the practice of medicine in rural communities have been discussed for years.

Six years ago, the Council of the Minnesota State Medical Association, with the approval of the House of Delegates and with the advice and assistance of the University Relations Committee, inaugurated the Rural Medical Student Scholarship. The implementation and administration of this scholarship plan were vested in the University Relations Committee. Because of the rotating nature of the make-up of the University Relations Committee, a special committee was appointed to guide the plan, with the advice and assistance of the University Relations Committee. This special committee, consisting of Dr. Frank Elias, chairman, of Duluth, Dr. Charles Sheppard, of Hutchinson, and Dr. Edward Simons, of Minneapolis, has administered this plan up to now. According to the report at the inauguration of the scholarship, it has two purposes, namely (1) an effort on the part of organized medicine to solve one of medicine's fundamental problems, the maldistribution of physicians, and (2) the improvement of public relations. The scholarship pays \$1,000 a year for four years. It is awarded on the basis of financial need, residence in a rural region or a town of less than 5,000 population, and an agreement to engage in general practice for five years in a location selected by the student from a list of ten towns of this size furnished by the Minnesota State Medical Association and the Minnesota State Board of Medical Examiners. The Scholarship Committee consists of the Dean of the Medical Sciences of the University of Minnesota, a member of the Council of the Minnesota State Medical Association representing one of the rural districts of the state, a rural editor chosen for that position by the Minnesota Editorial Association, and a qualified farmer chosen by the Minnesota Farm Bureau.

PRESIDENT'S LETTER

The first scholarship was awarded to Richard Engwall of Winthrop, Minnesota, who has completed it and is about to begin his five years of rural practice in Ivanhoe, Minnesota. The following men have been recipients of this scholarship since that first award: Leland Christenson, Marshall, 1954; Myron Doebler, Princeton, 1955; Carl E. Christenson, Stanchfield, 1956; and Vincent Hunt, Anoka, 1957. From now on, there will always be four recipients of the scholarship in the medical school at any one time.

Thus, a distinct effort has been made by the Minnesota State Medical Association toward the solution of this social medical problem.

Industry also has seen the need for an answer to this important question. As a result, the Sears, Roebuck Foundation has embarked on a plan to loan money to physicians to establish units for modern medical practice in communities where physicians are needed. This plan was put into effect in August, 1955, on a national basis, the country being divided into five regions. These regions are North Central, Pacific Coast, Southwestern, Southeastern and Northeastern. A central Sears, Roebuck Foundation office is located in each of these regions, the central office for our region being in Chicago. In the first year of this plan, applications were comparatively few. However, applications have increased steadily with dissemination of information about this plan. So far this year, the flow of applications into the Chicago office has been continuous and somewhat overwhelming; some 100 applications were received in the first three months of 1957. The Medical Advisory Board of Physicians, appointed by the Board of Trustees of the American Medical Association and consisting of two or three physicians from each region, determines the need for physicians in a given region and the advisability of a loan to any given physician. The chief consideration in the granting of these loans is the need of a physician in a given location. The effort of this organization also is to encourage physicians to establish modern medical practices in rural communities. This is another extremely worth-while attempt by a large industry to improve the maldistribution of physicians in this country.

I call attention to these two plans to emphasize that the physicians of Minnesota and the North Central states are making worth-while and dividend-yielding efforts to overcome one of the most basic problems facing the medical profession.

A large, stylized handwritten signature in black ink, reading "J. M. Borgen". The signature is fluid and cursive, with a large loop at the beginning and a long, sweeping tail.

President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

FEDERAL APPROPRIATIONS FOR U. S. PUBLIC HEALTH SERVICE

Appropriations for the new fiscal year commencing July 1, 1957, do not become effective until after the House and the Senate have reached final agreement on all details of the appropriations measures, but the action taken by the House Committee on the following requests can now be reported:

General Assistance to States

This appropriation item consists of a number of activities designed to help support and strengthen preventive health services in states and local communities. The Public Health Service had requested increases totaling \$7 million for these activities of which the House Appropriations Committee approved \$2 million.

Alaska, Grants and Special Studies

The Committee allowed the full budget request of \$2,165,000, an increase of \$995,000 over the amount appropriated last year. This will provide \$1 million to aid the Territory in assuming financial responsibility for an integrated program for the inpatient and outpatient care and treatment of the mentally ill of Alaska. The PHS is presently completing a comprehensive plan for construction of needed hospitals for the mentally ill of Alaska and will be requesting special grants under the Alaska Mental Health Enabling Act which was enacted last year.

Control of Venereal Disease

The Committee allowed the full budget request of \$4,415,000 which includes \$1,700,000 for grants to the states. The PHS reports that the national picture for the first time in eight years showed an increase in the number of infectious syphilis cases reported in the continental United States.

Control of Tuberculosis

The Committee allowed the full budget request of \$7 million which includes \$4.5 million for grants to states for tuberculosis control. An increase was allowed, largely for increased research

into the possible effectiveness of the drug, isoniazid, as a preventive of tuberculosis.

Control of Communicable Diseases

The Committee allowed \$6,200,000 for the work of the Communicable Disease Center, an increase of \$45,000,000 over the amount appropriated last year. This program provides facilities and services for the investigation, prevention and suppression of communicable and preventable diseases other than tuberculosis and venereal diseases.

Sanitary Engineering Activities

This appropriation item provides funds for PHS sanitary engineering activities which deal with environmental factors affecting man's health, including: air pollution, water supply and water pollution control, milk and food sanitation and radiological health.

Grants for Waste Treatment Works

The full \$50 million requested was allowed.

Hospital Construction Grants

The Committee allowed the full budget request of \$44,399,000 which will provide increases for traineeship grants for the advanced education of professional nurses and additional funds for the sixteen hospitals and 123 outpatient facilities operated by the PHS.

Foreign Quarantine Service

The \$3,876,000 allowed for the Foreign Quarantine Service includes an increase of \$203,000 for the control of yellow fever.

Indian Health Activities

For the next fiscal year the Committee allowed \$40 million.

Construction of Health Research Facilities

The House Committee approved the full budget request of \$30 million for the next fiscal year.

Office of the Surgeon General

The Committee allowed \$5,100,000 for the expenses of the divisions of the office of Surgeon

General. Almost half of the increase over last year is necessary to cover expenses for the national health survey program to obtain statistical information on illness and disability in the United States.

U. S. AID TO MEDICAL TRAINING INCREASES

Federal financial support of medical education is on the rise. The Public Health Service plans to inaugurate this summer a new program of research traineeships with every medical and dental school eligible to participate. In addition, the Department of HEW is asking Congress to let the Office of Vocational Rehabilitation finance the full three years of residency training for selected physicians interested in physical medicine and rehabilitation.

The PHS National Institutes of Health will finance the new research traineeships. Eighty-five medical, six osteopathic and forty dental colleges will have one billet each. Students who have completed two years of professional training will be eligible for stipends which will run up to \$3,200 plus \$350 each for dependents. Tenure will be for one year.

NEW HEALTH LEGISLATION IN CONGRESS

Disability Liberalization

Senator Revercomb (R., W. Va.) wants to liberalize broadly the eligibility requirements for payment of social security to disabled workers at age fifty. In introducing two bills on the subject, he stated that "a person must be all but dead to qualify for disability benefits under Public Law 880." Under S. 1811, the Senator would redefine disability. Under S. 1812, he would extend disability coverage to any worker determined to be permanently disabled under his new definition and who has had as little as one-quarter of coverage under social security.

Studies of Social Disability Program

In H. R. 195, Rep. Kelley (D., Pa.) asks for a full investigation of the social security disability program to be conducted by the House Ways and Means Committee.

Federal Workers' Health Insurance

Patterned along the lines of a bill proposed by the International Association of Machinists,

H. R. 6718 provides both basic and major medical coverage for civilian employees of the federal government and their dependents. The government would pay one-half the premium for basic and the full cost of major coverage or an amount equal to \$1.50 biweekly for any employee or \$4 biweekly if coverage includes dependents, whichever is the lesser. Workers would have a choice of plans.

Pre-testing of Food Chemicals

In H. R. 6747, Rep. Oren Harris (D., Ark.) proposes that Congress pass a law requiring that manufacturers of chemical additives to foods establish safety of their products before releasing them for sale.

U. S. Loans to Health Facilities

Senator Humphrey is still urging that federal loans be offered to voluntary nonprofit health insurance plans to help pay for cost of construction and equipment.

Loans Under Hill-Burton Act

Senator Hill (D., Ala.) wants the Hill-Burton hospital construction act modified to authorize loans as well as grants for various types of hospitals and health clinics and centers. Interest would be based on that paid on long-term, U. S. loans and loans would extend for a maximum of forty years.

U. S. Control Over Polio Vaccine

Rep. Green (D., Ore.) proposes that the Secretary of HEW exercise, until December 31, 1957, certain emergency controls over the distribution, sale price and use of poliomyelitis vaccine. The measure states that when there is a temporary shortage of polio vaccine, the Secretary of HEW should be authorized to (1) set priorities by age groups, (2) establish a selling price per unit, and (3) make allocations among the states.

Chiropractors in Compensation Cases

Senator Cooper (R., Ky.) proposes in S. 1650 that the use of chiropractic practitioners be authorized for injured U. S. employees under the Federal Employees Compensation Act. Presently, they are cared for in PHS hospitals if the hospital is conveniently located. Otherwise, care is given by approved private physicians and in private hospitals at government expense. This bill would

make chiropractic practitioners and hospitals eligible to care for such cases.

Pay Increases for VA Proposed

To encourage physicians, dentists and nurses to take up careers in the VA, Rep. Long (D., La.) proposes increases averaging between 10 and 12 per cent from the chief medical director on down. The bill also authorizes practice by optometrists in VA facilities.

Study of Doctor-Shortage Proposed

Rep. Dorn (D., S. C.) in H. R. 6602 proposes a commission to study the "shortage of doctors of medicine in the United States." The twelve-member commission would include physicians, be bi-partisan and be composed half from the Congress and the government and half from private life. The commission would look into the number of medical graduates, medical school admission policies, the number of persons unable to gain admission to medical schools and the extent to which foreign physicians are active in their profession in the United States.

U. S. DELEGATES NAMED TO WHO MEETING AT GENEVA

The tenth annual assembly of the World Health Organization was held May 6-27 at Geneva, Switzerland. Composition of the U. S. official delegation included Dr. Leroy E. Burney, USPHS Surgeon General, Dr. James R. Reuling, AMA trustee, and Dr. H. van Zile Hyde, chief of the international health division in USPHS.

WASHINGTON SELECTED AS MEDICAL LIBRARY SITE

When the regents of the National Library of Medicine assembled in Washington recently, it was to reach unanimous agreement and to make the announcement that Greater Washington will continue to be the home of the collection. It will be on the grounds of the National Institute of Health in suburban Bethesda, Maryland, about 12 miles northwest of the White House. Funds must still be obtained from Congress for the new building. The main obstacle now is the reluctance of the administration to ask Congress for building funds at a time when economy is being stressed, particularly for undertakings not in the "urgent" class.

NATIONAL HEALTH SURVEY BEGUN

Early in May, the Census Bureau launched the National Health Survey. Door-to-door canvassing will be conducted in every state. Interviewers will ask twenty-six questions, plus full details of recent illnesses, accidental injuries, confinements and surgical operations. The national sampling will cover 3,000 urban and rural households monthly for an indefinite period. Preliminary findings are expected to be published before the close of this year. Special statistical compilations will be made for the eight metropolitan areas which had more than 2,000,000 population in 1950: New York, Chicago, Los Angeles, Philadelphia, Detroit, San Francisco, Pittsburgh, and Boston.

Each adult in every household polled is to be checked for history of twenty-six chronic conditions; orthopedic, visual, hearing and other permanent impairments; time missed from work or housekeeping as a result of illness or invalidism. Residents will be asked when they last saw a physician, a dentist and, as an inpatient, the inside of a hospital.

The PHS for whom the Census Bureau is conducting the survey defines "Doctor" as a physician holding the degree, M.D. or D.O. In instances where the interviews disclose that he obtained diagnosis or treatment from someone other than a Doctor of Medicine or Doctor of Osteopathy, such attention will not be recorded as medical care. No information whatever will be sought on consumer costs of medical or dental treatment, hospitalization or health insurance.

ADMINISTRATION ENDORSES BARBITURATES CONTROL BILL

The Administration recently gave its approval to bills controlling the manufacture, distribution and possession of barbiturates and amphetamines. The House Interstate and Foreign Commerce health subcommittee held a one-day session on these bills just before its Easter recess. Reports of this session reveal that proposals for record-keeping and reporting would not apply to the medical profession; cutting down addiction will require more co-operation with the states, not just federal efforts; cost of the law during its first year would be \$500.00.

JOINT DECLARATION ON PHYSICIAN-HOSPITAL RELATIONS

1. The ownership and maintenance of the laboratory and x-ray facilities and the operation of same under this joint declaration is a proper function of a hospital.

2. Pathology and radiology services performed in hospitals are the product of the joint contribution of hospitals, doctors and technicians but these services constitute medical services which must be performed by or under the direction and supervision of a doctor, and no hospital shall have the right, directly or indirectly, to direct, control or interfere with the professional medical arts and duties of the doctor in charge of the pathology or radiology facilities or of the technicians under his supervision.

3. Each hospital should arrange for such services and for the direction and supervision of its pathology or radiology department by entering into an oral or written agreement with a doctor who is a member of or acceptable to the hospital medical staff. Such doctor may or may not be a specialist. The laboratory may be supervised and directed by a qualified member of the staff and specific services may be referred to a specialist, or the specialist may also direct and supervise the laboratory as may be desired. Any contract so entered into shall be in accordance with the principles stated herein.

4. Technicians and other personnel (not including doctors) in pathology or radiology departments, shall (unless the department is leased *or unless the hospital and doctor mutually agree otherwise*) be employes of the hospital, subject to the rules and regulations of the hospital applicable to employes generally, but under the direction and supervision of the doctor in charge of the Department as set forth elsewhere in this Declaration.

5. The doctors and hospitals shall mutually agree upon the employment of any technicians necessary for the proper operation of said Department and no technicians shall be dismissed from said employment without the mutual consent of the parties provided, however, that in the event the hospital and doctor are unable to mutually agree upon the hiring or discharge or disciplining of any employe of said Departments, the matter shall be promptly submitted to the joint conference committee.

Italicized portions of this agreement are amendments approved by the joint committee on November 12, 1956.

This physician-hospital agreement was developed and approved November 8, 1956, by a joint committee of hospital trustees and Medical Society representatives. As amended, it was ratified by the Board of Trustees of the Iowa Hospital Association on November 14, 1956, and by the Executive Council of the Iowa State Medical Society on November 15, 1956.

6. The contract between the hospital and doctor in charge of the laboratory or x-ray facilities may contain any provision for compensation of each upon which they mutually agree, provided, however, that no contract shall be entered into which in any way creates the relationship of employer and employe between the hospital and the doctor, and a percentage arrangement is not and shall not be construed to be unprofessional conduct on the part of the physician or in violation of the statutes of the State of Iowa upon the part of the hospitals.

7. The hospital admission agreement signed by the patient or his legal representative shall contain the following statement:

"Pathology and radiology services are medical services performed or supervised by physicians, and the personnel and facilities are furnished by the hospital for said services. Charges for such services are collected, however, by the hospital on behalf of said doctors pursuant to an agreement between said physicians and the hospital, and from said charges I consent that an agreed sum will be retained by the hospital in accordance with an existing agreement between the doctor and the hospital."

8. The hospital bill shall properly include the charges for pathology and radiology services as long as the name of the doctor is stated and it fairly appears that the charge is for medical services.

The said hospital bill shall also contain a statement substantially in the following form:

"The pathology and radiology charges are for medical services rendered by or under the direction of the doctor listed above and are collected by the hospital on behalf of the doctor, from which charges an agreed sum will be retained by the hospital in accordance with an existing agreement to which retention you consented at the time of your admission to the hospital."

9. All fees to be charged by the physicians for pathology and radiology services shall be mutually agreed upon by the hospital and the doctor. In the event dispute shall arise between the parties the matter shall be submitted for judgment to the Joint Conference Committee.

10. Fees for radiology and pathology services must be paid for as medical and not hospital services. In all cases this requires payment by "Blue Shield" (Iowa Medical Service) and not by "Blue Cross" (Hospital Service of Iowa).

11. Nothing in these principles is intended or should affect in any way that obligation of public hospitals under Chapter 347 or 380 of the Code of Iowa (1954), as well as the State Hospital at Iowa City, to provide medical treatment for indigent persons or tuberculosis patients as provided in Chapter 254 and Chapter 255 of the Code wherein medical treatment is to be provided by

hospitals of that category to patients of certain entitlement, nor to the operation by the State of mental or other hospitals authorized by law.

12. Whenever used herein the term:

- (a) "Hospital" shall include all hospitals licensed under Chapter 135B of the Code of Iowa (1954);
- (b) "Doctor" shall mean any person licensed to practice medicine and surgery under the provisions of Chapters 147 and 148 of the Code of Iowa (1954);
- (c) "Technician" shall mean either technician or technologists.
- (d) "Joint Conference Committee" shall mean the "Joint Conference Committee" as required by the Joint Commission on Accreditation of Hospitals.
- (e) "'Employes' as used the first time it appears in Paragraph 4 hereof, and 'employment' as used in Paragraph 5 hereof, shall include and pertain to members of the religious order operating the hospital even though the relationship of employer and employe does not exist between such members and the hospital."

13. This Joint Declaration shall be submitted to the Iowa State Medical Society and to the Iowa Hospital Association for approval on November 15, 1956, and it is recommended that this Joint Declaration be implemented by both organizations in a spirit of cooperation as to the pending Supreme Court appeal and in all other respects and that joint action by legislation be undertaken to legalize the principles herein stated wherever necessary.

Agreed to and signed this 8th day of November, 1956.

THOMAS L. MURPHY
JOSEPH T. KORNFELD
JOHN A. DAILEY
W. L. DOWNING, M.D.
GEORGE H. SCANLON, M.D.
R. B. THROCKMORTON

CANCER CURES AND DEATH RATE

"It is a paradox that with the immense knowledge at hand, the death rate from cancer continues to mount—although the number of cures of cancer is increasing," Dr. Grant H. Beckstrand, radiation therapist from Long Beach, California has reported.

His comments appeared in the March, 1957 issue of the *American Journal of Roentgenology, Radium Therapy and Nuclear Medicine*.

In his article, Dr. Beckstrand pointed out that much progress in understanding of the disease has been made, and financial support of cancer research has increased a hundred times over the money expended twenty-five years ago.

"The amount of money available," he added, however, "should be greatly increased, to direct intelligent Americans into cancer research."

Other highlights from Dr. Beckstrand's article: The cancer processes are as great as those of life itself. Indeed, in battling these processes, the human body, its normal physiology and psychology all must be weighed constantly.

One fact is clear: the cancer patient and not the cancer alone must be treated.

SOME NEGLECTED PRACTICAL POINTS IN ALLERGY

(Continued from Page 409)

supplied by the synthetic vitamins. Citrus fruit juices are not usually started until the child is eight to twelve months of age. As part of routine care (whether or not there is a family history of allergy), the mother is advised to rotate and diversify the child's diet, by giving different foods of the same family each day. I have not started cereal feeding with the mixed cereals, which usually contain wheat and corn, two very common allergens, but have had the mother alternate the single cereals, oatmeal, rice and barley. Such rotation is practiced with other foods as much as possible. In addition, where there is an allergic history, the parents are advised against having dogs and cats as pets, and feather pillows should be replaced by foam rubber or dacron pillows.

While an exact statistical analysis has not been possible, it seems the above-mentioned approach has been of considerable help in preventing the development of food sensitivities.

Summary

Allergic disease can be best diagnosed by history, physical examination and special allergic tests. The individual food tests are of much greater help than the skin test in determining food sensitivities. Allergic disease is managed best by avoidance of the offending allergens, hyposensitization when avoidance is not possible, and symptomatic therapy. Suggestions for symptomatic therapy are given.

References

1. Glaser, J.: *Allergy in Childhood*. Springfield, Illinois: Charles C Thomas, 1956.
2. Rinkel, H.; Randolph, T.; and Zeller, M.: *Food Allergy*, Springfield, Illinois: Charles C Thomas, 1951.
3. Hill, Lewis Webb: *The Treatment of Eczema in Infants and Children*. St. Louis: The C. V. Mosby Co., 1956.

The finding that 7.2 per cent of the patients in a tuberculosis sanatorium have "serologically proved" histoplasmosis and that the actual presence of the microorganism was demonstrated in 33 per cent of the cases is indeed remarkable. It certainly calls for very serious consideration of the importance of histoplasmosis in tuberculosis sanatoriums.—MICHAEL L. FURCOLOW and CHARLES A. BRASHER, M.D., *Am. Rev. Tuberc.*, May, 1956.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

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PHYSICIANS LICENSED FEBRUARY 10, 1956

January, 1956, Examination

<i>Name</i>	<i>School</i>		<i>Address</i>
CALDAROLA, Vincent Thomas	Creighton U.	MD 1955	3304 Hurlbut Place, San Diego, Calif.
DAARUD, Richard C.	Coll. Med. Evan.	MD 1953	7850 Golden Ave., Lemon Grove, Calif.
DILLENBURG, Cyril Joseph	Northwestern U.	MD 1955	111 E. Broadway, Little Falls, Minn.
ELLIOTT, Alvin John	U. Manitoba	MD 1950	U. Minn. Hospitals, Minneapolis, Minn.
GAILITIS, Veronika Milda	U. Latvia "Physician"	1936	State School & Hospital, Cambridge, Minn.
GOLDSCHMIDT, Volker	U. Goettingen Germany	MD 1945	St. Luke's Hospital, Duluth, Minn.
GOWAN, Jr., Lawrence R.	Marquette U.	MD 1955	St. Mary's Hospital, Duluth, Minn.
HATFIELD, Robert Edgar	U. Alberta	MD 1953	200 1st St. S.W., Rochester, Minn.
KAVANAUGH, Gerald John	Northwestern U.	MD 1954	200 1st St. S.W., Rochester, Minn.
KAZDAN, Martin Stephen	U. Toronto	MD 1954	200 1st St. S.W., Rochester, Minn.
LECLAIR, J. Maurice	McGill U.	MD 1951	200 1st St. S.W., Rochester, Minn.
LIEBHABER, Henia Fischer	Ludwig Maximilian U. Germany "Physician"	1950	916 E. 15th St., Minneapolis, Minn.
LIPPERT, Robert George	U. Toronto	MD 1954	200 1st St. S.W., Rochester, Minn.
LOWE, Ernest Wellman	Boston U.	MD 1953	U. Minn. Hospitals, Minneapolis, Minn.
LUCAS, Jr., Russell Vail	Washington U.	MD 1954	1885 Eleanor, St. Paul, Minn.
McCAMMON, Joseph	U. Manitoba	MD 1936	200 1st St. S.W., Rochester, Minn.
MEREDITH, Donald Charles	Washington U. St. Louis	MD 1954	Vet. Adm. Hospital, Minneapolis, Minn.
O'CONNELL, Patrick	Queen's U. Ireland	MB 1948	Memorial Hospital, Winchester, Va.
POTTER, Paul Herbert	Northwestern U.	MD 1951	1724 Greysolon Rd., Duluth, Minn.
RAGEN, Patrick Adair	U. Chicago	MD 1952	200 1st St. S.W., Rochester, Minn.
SCHULTZ, Earl Arthur	U. Manitoba	MD 1950	U. Minn. Hospitals, Minneapolis, Minn.
WELCH, Herbert Clark	U. Oregon	MD 1951	200 1st St. S.W., Rochester, Minn.
WILSON, Frederic Barlow	St. Louis U.	MD 1954	Vet. Adm. Hospital, Minneapolis, Minn.
ZELENY, Joseph Henry	St. Louis U.	MD 1954	200 1st St. S.W., Rochester, Minn.
ZIMMER, Roy William	U. Wisconsin	MD 1953	200 1st St. S.W., Rochester, Minn.

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BAKER, Norman Henry	Ohio State U.	MD 1954	200 1st St. S.W., Rochester, Minn.
CAWEIN, III, Madison Julius	Tulane Univ.	MD 1954	200 1st St. S.W., Rochester, Minn.
CLOWDUS, II, Bernard Frederick	Vanderbilt	MD 1954	200 1st St. S.W., Rochester, Minn.
COURTRIGHT, Anne Comfort	U. Oklahoma	MD 1951	Rochester State Hosp., Rochester, Minn.
CRILLY, Donn Howard	U. Nebraska	MD 1954	200 1st St. S.W., Rochester, Minn.
DANFORD, Harold Gene	U. Wisconsin	MD 1952	200 1st St. S.W., Rochester, Minn.
FEINBERG, Walter David	U. of Texas	MD 1952	200 1st St. S.W., Rochester, Minn.
FLINT, Charles House	Columbia U.	MD 1937	200 1st St. S.W., Rochester, Minn.
FRASER, Paul Samuel	Creighton U.	MD 1954	1833 2nd Ave., Anoka, Minn.
GOALD, Harold Jerome	Temple Univ.	MD 1954	Gary Emergency Clinic, Gary, W. Va.
HAGLIN, John Junell	Wayne U.	MD 1950	2121 E. River Terrace, Minneapolis, Minn.
HAMILTON, Jr., Samuel Logan	U. Illinois	MD 1941	628 W. 3rd St., Red Wing, Minn.
MEINKE, Richard Keydel	U. Michigan	MD 1951	200 1st St. S.W., Rochester, Minn.
OSMUNDSON, Philip John	U. of Iowa	MD 1952	200 1st St. S.W., Rochester, Minn.
ROTH, Harry Leo	Univ. of California	MD 1954	200 1st St. S.W., Rochester, Minn.
SANCHEZ, James Julian	U. of Colorado	MD 1954	200 1st St. S.W., Rochester, Minn.
STORINO, Henry E.	Creighton Univ.	MD 1953	200 1st St. S.W., Rochester, Minn.
STRICKLAND, Martha Jene Burke	U. Oklahoma	MD 1945	200 1st St. S.W., Rochester, Minn.
ULRICH, Emery Eugene	Ohio State U.	MD 1953	Crosby, Minn.
WADSWORTH, George L.	U. Oregon	MD 1935	State School & Hosp., Cambridge, Minn.
ZEMPEL, Alan Robert	U. Nebraska	MD 1950	Starbuck, Minn.

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ANZEL, Sanford Harold	New York Med. Col.	MD 1954	200 1st St. S.W., Rochester, Minn.
CHONG, Elaine Kui Kuen	Woman's Med. Coll.	MD 1951	412 Union St. S.E., Minneapolis, Minn.
COLEMAN, Thomas Paul	U. Minnesota	MD 1953	Hagere Heywot, Ambo Shoa, Ethiopia
CROLL, Diane	U. Manitoba	MD 1940	552 Med. Arts Bldg., Minneapolis, Minn.
EDWIN, Russell Leon	McGill Univ.	MD 1954	200 1st St. S.W., Rochester, Minn.

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MALKASIAN, Jr., George Durand	Boston Univ.	MD 1954	200 1st St. S.W., Rochester, Minn.
REDFORD, John Walter Burdett	U. of Toronto	MD 1953	200 1st St. S.W., Rochester, Minn.
RHOADS, Donald Vail	U. Pennsylvania	MD 1954	State Hospital, Rochester, Minn.
SCHADT, Daniel Calvin	Hahnemann Med. Coll.	MD 1953	200 1st St. S.W., Rochester, Minn.
WHOLEY, Mark Henry	Hahnemann Med. Coll.	MD 1953	200 1st St. S.W., Rochester, Minn.

PHYSICIANS LICENSED MAY 11, 1956

April, 1956, Examination

<i>Name</i>	<i>School</i>		<i>Address</i>
BAKER, Richard Kiger	U. Oregon	MD 1954	200 1st St. S.W., Rochester, Minn.
BLACKBURN, Jr., Henry Webster	Tulane U.	MD 1948	1232 Lowry Med. Arts Bldg., St. Paul, Minn.
de WERD, Robert W.	Loyola Univ.	MD 1955	502 S. 9th St., Olivia, Minn.
DUTHOY, Everette Joseph	Loyola Univ.	MD 1955	915 Broadway, Fargo, No. Dak.
GOTTLIEB, Cornelis Max	U. Amsterdam	MD 1951	200 1st St. S.W., Rochester, Minn.
	Netherlands		
GRONQVIST, Yrjo Kaarlo	U. Helsinki	Cand. of Med.	11 Ridgeview Ave., White Plains, N. Y.
Johannes	Finland	1947	
HENRIKSEN, Jens David	U. Copenhagen	"Candidatus Med."	226 N. Kuakini St., Honolulu, Hawaii
	Denmark	1938	
HOLTEN, John Robert	Temple U.	MD 1955	903 Cloquet Ave., Cloquet, Minn.
IVERS, Robert Ralph	Northwestern U.	MD 1955	814 8th Ave. No., Fargo, No. Dak.
LEWIS, David Richard	U. Illinois	MD 1954	200 1st St. S.W., Rochester, Minn.
METZEROTT, Kirk Oliver	Geo. Wash. U.	MD 1952	200 1st St. S.W., Rochester, Minn.
MILLERS, Alma Venters	U. Latvia	"Physician" 1931	State Hospital, Cambridge, Minn.
	Latvia		
RIMAS, Matthew Jurgis	Ludwig-Maximilian U.	1949	Comfrey, Minn
	Germany	"Physician"	
ROBERTSON, Gordon Leonard	U. Alberta	MD 1953	Mpls. Gen. Hosp., Minneapolis, Minn.
SANDKAMP, Virgil Anthony	St. Louis U.	MD 1955	107 7th Ave. So., South St. Paul, Minn.
SARTOR, Richard L.	Marquette U.	MD 1955	624 W. 54th St., Minneapolis, Minn.
SCHIRGER, Alexander	Charles U.	MD 1950	200 1st St. S.W., Rochester, Minn.
	Czechoslovakia		
SHIRLEY, Raymond Matthew	Marquette U.	MD 1955	115½ S. Dubuque, Iowa City, Iowa
SNYDER, Jerome Anthony	Creighton U.	MD 1955	64 W. 7th St., Winona, Minn.
SODERBERG, Richard James	U. Illinois	MD 1955	Grand Marais, Minn.
WITTOESCH, Joachim Hans	U. Wurzburg	MD 1949	200 1st St. S.W., Rochester, Minn.
	Germany		
WYS-SOUFFRONT, William A.	Creighton U.	MD 1953	200 1st St. S.W., Rochester, Minn.

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ALLEN, Jr., John Edward	Med. Coll. of Ga.	MD 1953	106 N. East Point St., East Point, Ga.
ARMSTRONG, Byron Henry	Indiana U.	MD 1950	907 Professional Bldg., Hopkins, Minn.
BLAKEY, Leslie Winfield	U. Louisville	MD 1947	200 1st St. S.W., Rochester, Minn.
BROW, Raymond Edward	U. So. Calif.	MD 1954	200 1st St. S.W., Rochester, Minn.
DODSON, Albertus Frederick	U. Nebraska	MD 1950	1st Nat. Bank, Brainerd, Minn.
FINLEY, Paul Reagan	U. Minnesota	MD 1953	Vet. Adm. Hospital, Minneapolis, Minn.
FLANARY, John Richard	Marquette U.	MD 1955	915 3rd Ave. S.E., Rochester, Minn.
GILPIN, Jr., Charles Alexander	U. Illinois	MD 1949	200 1st St. S.W., Rochester, Minn.
GLATHE, John Parsons	Stanford U.	MD 1953	200 1st St. S.W., Rochester, Minn.
HOWARD, Jr., Frank Melvin	U. Pennsylvania	MD 1952	200 1st St. S.W., Rochester, Minn.
MAKS, Stephen Wayne	Creighton U.	MD 1953	200 1st St. S.W., Rochester, Minn.
MARVIN, Joseph Ernest	U. Nebraska	MD 1952	1st Nat. Bank Bldg., Brainerd, Minn.
ORDAHL, Norman Bruce	U. California	MD 1951	109 W. 7th, Dickinson, No. Dak.
POSEY, Edward Will	Meharry Med. Coll.	MD 1952	Anoka State Hospital, Anoka, Minn.
RESTALL, Charles John	U. Tennessee	MD 1950	200 1st St. S.W., Rochester, Minn.
SHEELEY, William Flavel	U. of Chicago	MD 1941	Hastings State Hosp., Hastings, Minn.
SPUDIS, Edward Verhines	U. Maryland	MD 1953	200 1st St. S.W., Rochester, Minn.
VICKERS, Charles William	U. of Kansas	MD 1944	200 1st St. S.W., Rochester, Minn.

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ALBERT, Alexander	Harvard U.	MD 1943	200 1st St. S.W., Rochester, Minn.
CONNELL, Bruce Fowler	U. of Buffalo	MD 1952	200 1st St. S.W., Rochester, Minn.
CUSHING, Richard Tisdale	U. Rochester	MD 1953	4959 Excelsior Blvd., Minneapolis 16, Minn.
DOCKSEY, John Warren	Marquette U.	MD 1950	314 Becker Ave. W., Willmar, Minn.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

<i>Name</i>	<i>School</i>		<i>Address</i>
DUNN, Robert Cecil	Wash. U., St. Louis	MD 1936	623-24 Carver Bldg., Ft. Dodge, Ia.
HOEG, Dwight Carroll	Harvard U.	MD 1950	205 W. 2nd St., Duluth, Minn.
KARANSKY, Stanley	Duke Univ.	MD 1941	200 1st St. S.W., Rochester, Minn.
LARSON, Sherwood Lee	U. of Nebraska	MD 1946	520 S. 31st St., Omaha, Neb.
MORISAKI, Michael Minoru	U. Michigan	MD 1954	200 1st St. S.W., Rochester, Minn.
PETERSON, Donald Bullen	U. Minnesota	MD 1935	Anoka State Hospital, Anoka, Minn.
ROGERS, James E.	Georgetown U.	MD 1954	200 1st St. S.W., Rochester, Minn.
SELCHAU, Paul	McGill Univ.	MD 1953	Vet. Adm. Hospital, Minneapolis, Minn.
STOLTZE, Cynthia Ann	Northwestern U.	MD 1954	200 1st St. S.W., Rochester, Minn.
WHITCOMB, Jr., Fred Fletcher	Columbia U.	MD 1953	200 1st St. S.W., Rochester, Minn.
WOODRUFF, Whitney	Columbia U.	MD 1946	6th Ave & 9th St. N., Virginia, Minn.

PHYSICIANS LICENSED JULY 6, 1956

Regular Examination—June 19-21, 1956

<i>Name</i>	<i>School</i>		<i>Address</i>
ANDERSON, Russell Harry	U. of Iowa	MD 1955	1115 Med. Arts Bldg., Duluth, Minn.
GALWAY, Charles Fred	Queens U.	1934	Ancker Hospital, St. Paul, Minn.
	Bach. Med. & Surg.		
SEKANINA, Jan	Masaryk U.	MD 1935	Babbitt Infirmary, Babbitt, Minn.
	Czechoslovakia		

RECIPROCITY CANDIDATE

<i>Name</i>	<i>School</i>		<i>Address</i>
QUETSCH, Richard Morgan	Loyola Univ.	MD 1951	200 1st St. S.W., Rochester, Minn.

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Special Examination—June 12-14, 1956

<i>Name</i>	<i>School</i>		<i>Address</i>
ABRAMSON, Burton Ivan	U. Minnesota	MD 1956	Mpls. Gen. Hosp., Minneapolis, Minn.
ACKLEY, Dean Ralph	U. Minnesota	MD 1956	3435 W. Durango St., Phoenix, Ariz.
ANDERSON, Richard A.	U. Minnesota	MD 1956	Milwaukee Co. Hosp., Milwaukee, Wis.
ANDERSON, Robert Mauritz	U. Minnesota	MD 1956	Bethesda Hospital, St. Paul, Minn.
ASSAM, Sam	U. Minnesota	MD 1956	Philadelphia Gen. Hosp., Philadelphia, Pa.
BEDFORD, Fred Grinnell	U. Minnesota	MD 1956	Detroit Receiving Hosp., Detroit, Mich.
BENDER, David	U. Minnesota	MD 1956	Philadelphia Gen. Hosp., Philadelphia, Pa.
BILZENS, Valija Skaidrite	U. Minnesota	MD 1953	2300 N.E. Central Ave., Minneapolis, Minn.
BLOCHOWIAK, Beverly Jean	U. Minnesota	MD 1956	Madison Gen. Hosp., Madison, Wis.
BLOEMENDAAL, John William	Jefferson Med. Coll.	MD 1955	Mpls. Gen. Hosp., Minneapolis, Minn.
BREDESEN, Kenneth Neubauer	U. Minnesota	MD 1956	U. S. Naval Hosp., San Diego, Calif.
BROWN, Glenn Wayne	U. Nebraska	MD 1955	Bottineau, No. Dak.
BROWN, John Milton	U. Minnesota	MD 1956	Bethesda Hospital, St. Paul, Minn.
BURMAN, Richard E.	U. Minnesota	MD 1956	Bethesda Hospital, St. Paul, Minn.
BUSH, Robert Duane	U. Minnesota	MD 1956	Akron City Hosp., Market & Arch St., Akron, Ohio
COMFORT, Thomas Hermann	U. Minnesota	MD 1956	2130 Como Ave., St. Paul, Minn.
COVERT, Jean Faye La Vere	U. Minnesota	MD 1956	Sacramento Co. Hosp., Sacramento, Calif.
DAHL, John Harrison	U. Minnesota	MD 1956	Tripler Army Hosp., Honolulu, Oahu, T. H.
DAVIS, Richard La Vern	U. Minnesota	MD 1956	Bellevue Hosp., 3rd Med. Div., N. Y., N. Y.
DEVLOO, Robert	Cath. U. Louvain	MD 1938	200 1st St. S.W., Rochester, Minn.
DINSMORE, Robert Elmer	U. Minnesota	MD 1956	818 Harrison Ave., Boston, Mass.
DOUGHERTY, Donald Earl	U. Minnesota	MD 1956	3548 "Y" St., Sacramento, Calif.
DRILL, Frederick Ernst	U. Minnesota	MD 1956	Mpls. Gen. Hosp., Minneapolis, Minn.
EDDY, Richard Lee	U. Minnesota	MD 1956	2315 Stockton Blvd., Sacramento, Calif.
EDLUND, Richard Allan	U. Minnesota	MD 1956	Jackson Mem. Hosp., 1000 N.W. 17th St., Miami, Florida
EKLUND, Gerald Greene	U. Minnesota	MD 1956	U.S.P.H.S. Hospital, Baltimore, Md.
ELLINGSON, Abel Raymond	U. Minnesota	MD 1956	U. S. Naval Hospital, Oakland, Calif.
ENGWALL, Richard Lambert	U. Minnesota	MD 1956	Bethesda Hospital, St. Paul, Minn.
ERICKSON, Darroll James	U. Minnesota	MD 1956	Bethesda Hospital, St. Paul, Minn.
FLOGSTAD, Duane Lowell	U. Minnesota	MD 1956	401 E. 2nd St., Duluth, Minn.
FOLEY, William Arthur	U. Minnesota	MD 1956	3395 Scranton Rd., Cleveland, Ohio
FRUCHTMAN, Martin Zolle	U. Minnesota	MD 1956	8700 W. Wisconsin Ave., Milwaukee, Wis.
FRUCHTMAN, Robert Bernard	U. Minnesota	MD 1956	8700 W. Wisconsin Ave., Milwaukee, Wis.
GABRIELSON, Ronald Manford	U. Minnesota	MD 1956	1200 N. State St., Los Angeles, Calif.
GILBERT, Harry	U. of Minnesota	MD 1923	9121 Cresta Drive, Los Angeles, Calif.
GOLDBERG, Stanley Morton	U. Minnesota	MD 1956	Mpls. Gen. Hosp., Minneapolis, Minn.

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GOTTLIEB, David Irwin	U. Minnesota	MD 1956	L. A. Co. Gen. Hosp., Los Angeles, Calif.
GREENBERG, Richard Alan	U. Minnesota	MD 1956	780 E. Gilbert St., San Bernardino, Calif.
GRONVALL, John Arnold	U. Minnesota	MD 1956	Mpls. Gen. Hosp., Minneapolis, Minn.
HALLGREN, Roger Bernard	U. Minnesota	MD 1956	8900 W. Wisconsin Ave., Milwaukee, Wis.
HANSON, Harlis Duane	U. Minnesota	MD 1956	Ancker Hospital, St. Paul, Minn.
HANSON, Eugene William	U. Minnesota	MD 1956	516 10th Ave. S., St. Petersburg, Fla.
HARTIG, Paul Richard	U. Minnesota	MD 1956	Ancker Hospital, St. Paul, Minn.
HAYDEN, Jr., Royal Clifford	U. Minnesota	MD 1956	Fitzsimons Army Hosp., Denver, Colo.
HIDUCHENKO, Katherine	U. Minnesota	MD 1954	8639 14 Ave., Brooklyn, N. Y.
HOAR, Leland Wesley	U of Oregon	MD 1955	1490 Norway St., Salem, Oregon
HOVDE, DeLarry Ruel	U. Minnesota	MD 1956	451 Clarkson Ave., Brooklyn, N. Y.
HOVDE, Gordon Wayne	U. Minnesota	MD 1956	1326 St. Antoine St., Detroit, Mich.
HUSEBY, Walter Scott	U. Minnesota	MD 1956	1112 E. 1st St., Duluth, Minn.
HYMAN, III, Harris	Harvard U.	MD 1955	818 Harrison Ave., Boston, Mass.
HYMES, Alan Charles	U. Minnesota	MD 1956	Kings Co. Hosp. Center, Brooklyn, N. Y.
JOHN, Robert Herman	U. Minnesota	MD 1956	St. Luke's Hospital, Duluth, Minn.
JOHNSON, William Carlyle	U. Minnesota	MD 1956	12 & E. St., Salt Lake City, Utah
JOSEPH, Arnold H.	U. Minnesota	MD 1956	U. Minn. Hospitals, Minneapolis, Minn.
JOSSE, John William	U. Minnesota	MD 1956	Massachusetts Gen. Hosp., Boston, Mass.
KAISER, Harold Bernard	U. Minnesota	MD 1956	Kings County Hosp., Brooklyn, N. Y.
KARISH, Louis John	U. Minnesota	MD 1955	1580 Nome St., Aurora, Colo.
KELLY, John Thomas	U. Minnesota	MD 1956	Mpls. Gen. Hosp., Minneapolis, Minn.
KOSIAK, Irene	U. Minnesota	MD 1956	St. Mary's Hosp., San Francisco, Calif.
KOZEL, William Joseph	U. Minnesota	MD 1956	Ancker Hospital, St. Paul, Minn.
KUSS, Gerald Wallace	U. Minnesota	MD 1956	U.S.P.H.S. Hospital, Seattle, Wash.
LaFAVE, James William	U. Minnesota	MD 1956	34 St. & Curie Ave., Philadelphia, Pa.
LARSON, Donna J. Halling	U. Minnesota	MD 1956	521 Division St., Madison, Wis.
LAWSON, Warren Robert	U. Minnesota	MD 1956	Mpls. Gen. Hosp., Minneapolis, Minn.
LENSINK, Everett Raymond	U. Minnesota	MD 1956	Mpls. Gen. Hosp., Minneapolis, Minn.
LEWIS, Jr., Glenn Marcus	U. Minnesota	MD 1956	Mpls. Gen. Hosp., Minneapolis, Minn.
LIEBERMAN, Richard Barr	U. Minnesota	MD 1956	Veterans Adm. Hosp., Long Beach, Calif.
LINDQUIST, Dale Carlyle	U. Minnesota	MD 1956	St. Luke's Hospital, Duluth, Minn.
LINNEMANN, Roger Edward	U. Minnesota	MD 1956	2018 Lansdowne Way, Silver Spring, Md.
LOMMEN, Peter Arnold	U. of Texas	MD 1955	610 Greenwich, Austin, Minn.
LOWE, Alexander Duncan	U. Minnesota	MD 1956	Chas. T. Miller Hosp., St. Paul, Minn.
MADSEN, Donald Orville	U. Minnesota	MD 1956	Ancker Hospital, St. Paul, Minn.
MENDELSON, David Frey	Indiana U.	MD 1948	2115 E. River Rd., Minneapolis, Minn.
MENGUY, Rene Borivoi Karl	U. Paris, France	MD 1951	200 1st St. S.W., Rochester, Minn.
MODELEVSKY, Herbert Martin	U. Minnesota	MD 1956	Los Angeles Co. Hosp., Los Angeles, Calif.
MOE, Paul Gerald	U. Minnesota	MD 1956	Cincinnati Gen. Hosp., Cincinnati, Ohio
MORTENSEN, Norval	U. Minnesota	MD 1956	Mpls. Gen. Hosp., Minneapolis, Minn.
MURRAY, Jr., Robert Anthony	U. Minnesota	MD 1956	Tripler Army Hosp., Moanalua Oahu, T. H.
			APO 438, San Francisco, Calif.
NOSOWSKY, Emanuel Ezra	U. Minnesota	MD 1956	Kings County Hosp., Brooklyn, N. Y.
O'HEARN, Jerome William	U. Minnesota	MD 1956	Ancker Hospital, St. Paul, Minn.
OLMANSON, Myron Donald	U. Minnesota	MD 1956	Mpls. Gen. Hosp., Minneapolis, Minn.
OLSON, Robert Thomas	U. Minnesota	MD 1956	Chas. T. Miller Hosp., St. Paul, Minn.
PAGE, Arthur Raymond	U. Minnesota	MD 1956	U. S. Naval Hospital, Bethesda, Md.
PAULSON, Paul Sherman	U. Minnesota	MD 1956	Mpls. Gen. Hosp., Minneapolis, Minn.
PEIKERT, Carl Frank	U. Minnesota	MD 1956	St. Luke's Hospital, Duluth, Minn.
PLUTH, James Raymond	U. Minnesota	MD 1956	3395 Scranton Road, Cleveland, Ohio
PURDIE, James Lawrence	U. Minnesota	MD 1956	1829 Beechwood Ave., St. Paul, Minn.
QUAST, John Edward	U. Minnesota	MD 1956	Fairfax, Minn.
RAMRAS, Donald Gene	U. Minnesota	MD 1956	Mpls. Gen. Hosp., Minneapolis, Minn.
REICHEL, Leland Gordon	U. Minnesota	MD 1956	St. Luke's Hospital, Duluth, Minn.
RENOLLET, Harold LeRoy	U. Minnesota	MD 1956	1511 Lander St., Seattle, Wash.
RICHARDS, John Carliss	U. Minnesota	MD 1956	Tripler Army Hosp., Oahu, T. H., APO 438, San Francisco, Calif.
ROBINSON, Margaret Glasgow	U. Minnesota	MD 1956	451 Clarkson, Brooklyn, N. Y.
RODICH, Filmore Stanley	U. Minnesota	MD 1956	250 Willard Ave., Staten Island, N. Y.
ROSENHOLTZ, Mitchell Jay	U. Minnesota	MD 1956	Cincinnati Gen. Hosp., Cincinnati, Ohio
ROTHSTEIN, Loren	U. Minnesota	MD 1956	1596 Timberlake Rd., #F, St. Paul, Minn.
RUCKER, Thomas King	U. Minnesota	MD 1956	Mpls. Gen. Hosp., Minneapolis, Minn.
RUDOLPH, Jerome Howard	U. Minnesota	MD 1956	1124 W. Carson, Torrance, Calif.
SANDBERG, Burton Charles	U. Minnesota	MD 1955	East Range Clinic, Aurora, Minn.
SANDER, John Lee	U. Minnesota	MD 1956	Ancker Hospital, St. Paul, Minn.
SAVELKOUL, Gene Roger	U. Minnesota	MD 1956	Maricopa County Hosp., Phoenix, Ariz.
SCHERMAN, Francis G.	Marquette U.	MD 1955	524 Lowry Med. Arts Bldg., St. Paul, Minn.
SCHLICHTING, Frederick Robert	U. Minnesota	MD 1956	Santa Clara County Hosp., San Jose, Calif.
SCHULTZ, Robert James	U. Minnesota	MD 1956	U. Minn. Hospitals, Minneapolis, Minn.
SCHULZ, Emil	U. Minnesota	MD 1956	U.S.P.H.S. Hospital, Seattle, Wash.
SHEEHAN, John Marlowe	U. Minnesota	MD 1956	Veterans Adm. Hosp., Wilshire & Sawtelle Blvd., Los Angeles, Calif.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

<i>Name</i>	<i>School</i>		<i>Address</i>
SHRAGG, Sam	U. Minnesota	MD 1956	Harbor Gen. Hospital, Torrance, Calif.
SHURE, Harold	U. Minnesota	MD 1956	1124 W. Carson, Torrance, Calif.
SIGEL, Melvin Edward	U. Minnesota	MD 1956	1639 Russell Ave. No., Minneapolis, Minn.
SMITH, John Edward	U. Minnesota	MD 1956	St. Mary's Hospital, Duluth, Minn.
SOMBECK, John Bernard	U. Minnesota	MD 1956	St. Mary's Hospital, Duluth, Minn.
STAFNE, John Gilbert	U. Minnesota	MD 1956	Mercy Hosp., 2221 Madison Ave., Toledo, Ohio
STEWART, Robert Carlyle	U. Minnesota	MD 1953	180 Morton St., Jamaica Plain, Mass.
STOLEE, Curtis Neal	U. Minnesota	MD 1956	2928 30th Ave. So., Minneapolis, Minn.
STOLOV, Walter Charles	U. Minnesota	MD 1956	U.S.P.H.S. Hospital, Baltimore, Md.
STORMO, Alan Carlyle	U. Minnesota	MD 1956	Wayne County Gen. Hosp., Eloise, Mich.
STULBERG, Harold Jerome	U. Minnesota	MD 1956	Harbor General Hosp., Torrance, Calif.
SUNDBERG, Arthur Bruce	U. Minnesota	MD 1956	U.S.P.H.S. Hospital, 15 & Lake, San Francisco, Calif.
SWANSON, Ernest Bruce	U. Minnesota	MD 1956	8th & Spruce, Philadelphia, Pa.
SWANSON, Ralph Buford	U. Minnesota	MD 1956	2391 Moorpark Ave., San Jose, Calif.
TAMBORNINO, Joseph M.	U. Minnesota	MD 1956	Ancker Hospital, St. Paul, Minn.
TANGEN, George Victor	U. Minnesota	MD 1956	Mpls. Gen. Hosp., Minneapolis, Minn.
WALL, Jack Edward	U. Minnesota	MD 1956	St. Luke's Hosp., 915 E. 1st St., Duluth, Minn.
WILLIAMS, John Patrick	U. Minnesota	MD 1956	Ancker Hospital, St. Paul, Minn.
WONG, Howard How	U. Minnesota	MD 1956	Mercy Hosp., 2221 Madison Ave., Toledo, Ohio
WRIGHT, Robert M.	U. Minnesota	MD 1956	827 Northampton Dr., Silver Spring, Md.
ZARLING, Max Eugene	U. Minnesota	MD 1956	U. Minn. Hospitals, Minneapolis, Minn.

RECIPROCITY CANDIDATES

<i>Name</i>	<i>School</i>		<i>Address</i>
BEAN, Charles Norman	State U. of Iowa	MD 1955	Waconia, Minn.
CAMPBELL, Denis Vincent	Marquette U.	MD 1952	108 Vasa Ave. E., Fergus Falls, Minn.
KUMP, Warren Lee	U. of Kansas	MD 1950	1631 Med. Arts Bldg., Minneapolis, Minn.
LINDERHOLM, Bruce Edgar	U. Michigan	MD 1948	545 Med. Arts Bldg., Minneapolis, Minn.
NIXON, James Wesley	Baylor U.	MD 1952	200 1st St. S.W., Rochester, Minn.
PARR, Eugene Quincy	U. Louisville	MD 1952	200 1st St. S.W., Rochester, Minn.
PORRETTA, George Francis	U. of Michigan	MD 1954	200 1st St. S.W., Rochester, Minn.
RODDA, Thaddeus Salter	U. Tennessee	MD 1949	200 1st St. S.W., Rochester, Minn.
SHERWOOD, Jr., Clarence Eugene	U. Colorado	MD 1953	Veterans Adm. Hosp., Minneapolis, Minn.
SPIELER, Forrest Benjamin	U. Nebraska	MD 1935	Pequot Lakes, Minn.
VOTEL, Thomas Warren	St. Louis U.	MD 1955	1698 No. Lexington Ave., St. Paul, Minn.
WILLIAMS, David Evans	U. So. California	MD 1954	U. Minn. Hospitals, Minneapolis, Minn.
YATSO, Michael G.	Marquette U.	MD 1953	1977 S. 81st St., Milwaukee, Wis.

NATIONAL BOARD CANDIDATES

<i>Name</i>	<i>School</i>		<i>Address</i>
ADAMS, Harold Robinson	State U. of N. Y.	MD 1952	519 Lowry Med. Arts Bldg., St. Paul, Minn.
AUST, Jr., J. Bradley	U. of Buffalo	MD 1949	U. Minn. Hospitals, Minneapolis, Minn.
BRIGGS, Kenneth Ralph	Harvard Univ.	MD 1954	Veterans Adm. Hosp., Minneapolis, Minn.
FODERICK, Peter Paul	U. Western Ontario	MD 1953	Plum City, Wis.
GELFORD, Gerald Jerome	Coll. Med. Evang.	MD 1955	Bayport, Minn.
MEYERS, Vernon William	Creighton U.	MD 1955	Creighton U. Sch. Med., Omaha, Nebr.
MILLER, Mary Margaret	State U. of N. Y.	MD 1951	U. Minn. Hospitals, Minneapolis, Minn.
SCHULTZ, Robert Brown	Yale U.	MD 1952	U. Minn. Med. School, Minneapolis, Minn.
SHAPIRO, Irving	U. Western Ontario	MD 1951	1750 Med. Arts Bldg., Minneapolis, Minn.

PHYSICIANS LICENSED NOVEMBER 9, 1956

October, 1956, Examination

<i>Name</i>	<i>School</i>		<i>Address</i>
AMUNDSON, Loren Hugh	U. Wisconsin	MD 1956	Chas. T. Miller Hosp., St. Paul, Minn.
BECKER, Robert Edward	Northwestern U.	MD 1956	St. Mary's Hospital, Minneapolis, Minn.
BENNETT, Richard Charles	U. Oregon	MD 1956	Mpls. Gen. Hosp., Minneapolis, Minn.
BERRY, Jack Thomas	U. So. California	MD 1956	Ancker Hospital, St. Paul, Minn.
BIGG, Richard Louis	U. Pennsylvania	MD 1955	200 1st St. S.W., Rochester, Minn.
BOWEN, Jr., Stephen Francis	Tufts Univ.	MD 1956	U. Minn. Hospitals, Minneapolis, Minn.
BRAVICK, Donald Dean	U. of Chicago	MD 1953	U. Minn. Hospitals, Minneapolis, Minn.
DAVID, Andre	U. of Montreal	MD 1952	200 1st St. S.W., Rochester, Minn.
DAVIS, Richard Bradley	Univ. of Iowa	MD 1953	U. Minn. Hospitals, Minneapolis, Minn.
DOBBS, Richard Laurence	Loyola Univ.	MD 1955	200 1st St. S.W., Rochester, Minn.
FLANARY, Lawrence Michael	Marquette U.	MD 1956	2500 S. 6th St., Minneapolis, Minn.
GYDE, Maurice Charles	U. Manitoba	MD 1945	200 1st St. S.W., Rochester, Minn.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

<i>School</i>	<i>Name</i>		<i>Address</i>
HARRIS, Russell Hugh	Jefferson Med. Coll.	MD 1956	Mpls. Gen. Hosp., Minneapolis, Minn.
JONES, John Evan	Univ. of Utah	MD 1955	U. Minn. Hospitals, Minneapolis, Minn.
KEMP, William Edward	U. of Illinois	MD 1956	St. Mary's Hosp., 401 E. 3rd St., Duluth, Minn.
KIM, Mark Kibong	National U. Korea	MD 1948	1406 6th Ave. No., St. Cloud, Minn.
KNAFF, Leo Joseph	Loyola Univ.	MD 1955	200 1st St. S.W., Rochester, Minn.
KRAMER, James DeLancy	Loyola Univ.	MD 1956	St. Joseph's Hospital, St. Paul, Minn.
LANGSJOEN, George Edward	U. Kansas	MD 1955	U. Minn. Hospitals, Minneapolis, Minn.
LEIGH, John Edward	Harvard U.	MD 1955	200 1st St. S.W., Rochester, Minn.
McDONALD, Colin Campbell	U. Manitoba	MD 1955	200 1st St. S.W., Rochester, Minn.
McPHERSON, James Roy	U. Manitoba	MD 1954	200 1st St. S.W., Rochester, Minn.
MERRITT, William Herbert	U. of Utah	MD 1955	U. Minn. Hospitals, Minneapolis, Minn.
MURPHY, Thomas Roy	Dalhousie U.	MD 1956	200 1st St. S.W., Rochester, Minn.
MURRAY, Murray John	U. New Zealand	MD 1954	U. Minn. Hospitals, Minneapolis, Minn.
NUTTALL, Frank Quentin	Univ. of Utah	MD 1955	Veterans Adm. Hosp., Minneapolis, Minn.
PHIBBS, Jr., Clifford Matthew	U. Washington	MD 1955	Ancker Hospital, St. Paul, Minn.
PRENTICE, Walter Benton	Loyola Univ.	MD 1956	St. Joseph's Hospital, St. Paul, Minn.
RAWLINSON, Richard A.	U. of Oregon	MD 1956	Ancker Hospital, St. Paul, Minn.
SCHWARTZ, John Theodore	Jefferson Med. Coll.	MD 1955	200 1st St. S.W., Rochester, Minn.
SELLA, John L.	Marquette U.	MD 1956	St. Mary's Hospital, Minneapolis, Minn.
TAILLEFER, Jean Bernard	U. of Ottawa	MD 1954	200 1st St. S.W., Rochester, Minn.
WIGDAHL, Luther Oliver	U. of Illinois	MD 1956	St. Mary's Hospital, Minneapolis, Minn.
WRAGE, Keith Louis	Northwestern U.	MD 1956	Chas. T. Miller Hosp., St. Paul, Minn.

RECIPROCITY CANDIDATES

<i>Name</i>	<i>School</i>		<i>Address</i>
BARNES, Jr., Robert Henry	Tulane Univ.	MD 1949	200 1st St. S.W., Rochester, Minn.
BARNETT, Robert McClellan	Northwestern U.	MD 1950	321 Med. Arts Bldg., Minneapolis, Minn.
BATTAGLINO, Jr., John Joseph	Med. Coll. Va.	MD 1955	200 1st St. S.W., Rochester, Minn.
BEARGIE, Richard John	Loyola Univ.	MD 1955	200 1st St. S.W., Rochester, Minn.
BERMAN, Irwin B.	U. of Texas	MD 1953	200 1st St. S.W., Rochester, Minn.
BERMAN, Stanley J.	U. of Texas	MD 1953	200 1st St. S.W., Rochester, Minn.
BILLINGSLEY, John Smith	Western Reserve U.	MD 1955	200 1st St. S.W., Rochester, Minn.
BOWEN, Jr., Ralph	Baylor U.	MD 1955	200 1st St. S.W., Rochester, Minn.
CONNOR, Jr., Patrick James	Creighton U.	MD 1955	200 1st St. S.W., Rochester, Minn.
CRANSTON, Robert W.	U. Wisconsin	MD 1949	U. Wisconsin Hospital, Madison, Wis.
DOWNING, Fenworth M.	U. Nebraska	MD 1953	508 10th St., Worthington, Minn.
HAASE, Donald Delby	U. Nebraska	MD 1947	Silver Bay, Minn.
HAUSER, Harris Milton	Baylor U.	MD 1955	200 1st St. S.W., Rochester, Minn.
HOOKE, John Patrick	U. of Texas	MD 1954	200 1st St. S.W., Rochester, Minn.
HUGHES, Jr., Hugh Joseph	U. Pennsylvania	MD 1953	200 1st St. S.W., Rochester, Minn.
LEWALLEN, Gene Sheldon	U. of Nebraska	MD 1953	130 So. Lake, Mora, Minn.
MAYBERRY, William Eugene	U. of Tennessee	MD 1953	200 1st St. S.W., Rochester, Minn.
McGILL, Leon K.	Northwestern U.	MD 1952	1214 11th Ave. So., Virginia, Minn.
McNEIL, Maurice Ralph	Northwestern U.	MD 1953	1017 Hennepin Ave., Glencoe, Minn.
OLINGER, John Neil	Northwestern U.	MD 1951	37 28th Ave. No., St. Cloud, Minn.
ORKIN, Milton	Tulane Univ.	MD 1954	Mpls. Gen. Hosp., Minneapolis, Minn.
RUSHING, Jr., Lige Burroughs	Baylor Univ.	MD 1951	200 1st St. S.W., Rochester, Minn.
RUSSELL, Jr., Marion Fore	U. of Kansas	MD 1955	200 1st St. S.W., Rochester, Minn.
SHUGART, Robert Ross	Northwestern U.	MD 1955	200 1st St. S.W., Rochester, Minn.
STEWART, Gordon Troup	U. Arkansas	MD 1943	Mount Ida Clinic, Mt. Ida, Ark.
STOOL, Newsom	Baylor Univ.	MD 1953	200 1st St. S.W., Rochester, Minn.
TUFFANELLI, Denny Lee	Stanford U.	MD 1955	200 1st St. S.W., Rochester, Minn.
WALLACE, Helen Margaret	Columbia U.	MD 1937	U. Minn. Sch. Pub. Health, Minneapolis, Minn.

NATIONAL BOARD CANDIDATES

<i>Name</i>	<i>School</i>		<i>Address</i>
ARNOLD, John Wait	Yale Univ.	MD 1852	200 1st St. S.W., Rochester, Minn.
ARNOLD, Thomas Burton	U. Pennsylvania	MD 1955	1633 Med. Arts Bldg., Minneapolis, Minn.
BARTLETT, William Veeder	N. Y. Med. Coll.	MD 1953	Veterans Adm. Hospital, Albany, N. Y.
BERMAN, Harold John	New York U.	MD 1953	200 1st St. S.W., Rochester, Minn.
BOYLE, Jr., Francis Joseph	Creighton U.	MD 1955	113 3rd St., Tracy, Minn.
BRADLEY, Jeanne Barinott	Geo. Wash. U.	MD 1951	6632 Lyndale Ave. So., Minneapolis, Minn.
BROWN, Jr., Philip Walling	U. Pennsylvania	MD 1953	200 1st St. S.W., Rochester, Minn.
CHERVENAK, William Aloysius	Geo. Wash. U.	MD 1955	Long Prairie, Minn.
DECKERT, Gordon Harmon	Northwestern U.	MD 1955	200 1st St. S.W., Rochester, Minn.
ERMSHAR, Carl Boyer	Coll. Med. Evang.	MD 1939	3590 Imperial, Lynwood, Calif.
FEINERMAN, Burton	N. Y. Med. Coll.	MD 1954	200 1st St. S.W., Rochester, Minn.
GEDGE, Stafford William	Albany Med. Coll.	MD 1955	200 1st St. S.W., Rochester, Minn.
GILL, Charles Richard	Geo. Wash. U.	MD 1955	200 1st St. S.W., Rochester, Minn.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

<i>Name</i>	<i>School</i>	<i>Address</i>
HECKMAN, Donald Christopher	State U. of N. Y.	MD 1954 U. Minn. Hospital, Minneapolis, Minn.
HOMME, David	Stanford U.	MD 1955 200 1st St. S.W., Rochester, Minn.
HUTCHINSON, John Corrin	Harvard Univ.	MD 1954 Veterans Adm. Hosp., Minneapolis, Minn.
JEPSON, William Warner	Cornell Univ.	MD 1950 U. Minn. Hospitals, Minneapolis, Minn.
JOHNSON, Calvin Joseph	State U. of Iowa	MD 1949 504 1st Ave. W., Grand Rapids, Minn.
JUDGE, Jr., Walter Thomas	State U. of Iowa	MD 1953 41 E. Fort Harrison Village, Fort Ben Harrison, Ind.
KUMASAKA, Glen Hisashi	U. of Rochester	MD 1955 U. Minn. Hospitals, Minneapolis, Minn.
MASTMAN, Gary J.	U. of Buffalo	MD 1955 200 1st St. S.W., Rochester, Minn.
MONGE, James Joseph	Northwestern U.	MD 1955 200 1st St. S.W., Rochester, Minn.
NOLAN, Robert Bernard	Creighton U.	MD 1955 200 1st St. S.W., Rochester, Minn.
OVERTON, Jr., Dolphin Henry	Duke Univ.	MD 1953 200 1st St. S.W., Rochester, Minn.
OWEN, Richard Roberts	Geo. Wash. U.	MD 1953 200 1st St. S.W., Rochester, Minn.
RESZEL, Paul Arthur	N. Y. Univ.	MD 1954 200 1st St. S.W., Rochester, Minn.
RIPPLE, Rudolph Jordan	U. Minnesota	MD 1953 Veterans Adm. Hosp., Minneapolis, Minn.
SAGER, Stanley Melvin	Geo. Wash. U.	MD 1953 200 1st St. S.W., Rochester, Minn.
SIMENSTAD, Paul Otis	U. of Rochester	MD 1954 Box H, Osceola, Wis.
SMALLEY, Robert Rowan	McGill Univ.	MD 1954 200 1st St. S.W., Rochester, Minn.
STARR, Jason Leonard	Harvard U.	MD 1953 200 1st St. S.W., Rochester, Minn.
SUECHTING, Ralph Ludwig	Columbia U. Coll. P & S	MD 1952 U. Minn. Hospitals, B-590 Mayo Memorial, Minneapolis, Minn.
VIREN, Fred Kenneth	Geo. Wash. U.	MD 1955 200 1st St. S.W., Rochester, Minn.
WILLIAMS, Justin L.	Stanford U.	MD 1955 U. Minn. Hospitals, Minneapolis, Minn.

SAINT PAUL BARBER SENTENCED FOR ILLEGAL SALE OF MEDICINE

Re: State of Minnesota vs. Thomas A. Medella

On April 26, 1957, Thomas A. Medella, seventy-six, 437 University Avenue, Saint Paul, was sentenced by the Hon. Archie L. Gingold, Judge of Saint Paul Municipal Court, to a term of thirty days in the Saint Paul Workhouse after being found guilty of the illegal sale of medicine. The complaint against the defendant, which was signed by a representative of the Minnesota State Board of Medical Examiners, specifically charged Medella with wilfully selling at retail a medicine "helpful for eczema, skin itch, old sores, pile sufferers, athlete's foot and dandruff" in a place other than a pharmacy. After telling the defendant that the purpose of this law was to protect the public and that his actions had been detrimental to the reputation of the whole barbering profession, Judge Gingold suspended Medella's sentence for a period of one year on condition that he be a law abiding citizen. Medella testified at the trial that he had attended a barber college in Rome, Italy, for three years and that he came to Saint Paul in 1911.

The evidence in the case indicated that when a Saint Paul man was having his hair cut at the defendant's barber shop at 511 Wabasha Street on April 8, 1957, Medella displayed a bottle of "Cahcetula" and stated that it was a medicine made from a tree that grows in Italy. After examining the customer's scalp, Medella told him that he had dandruff and that medical science had found that dandruff was one of the chief causes of cancer. Medella then proceeded to give the customer a scalp massage, notwithstanding the customer's protest, by using a bottle of "Cahcetula," the label on which represented that it was manufactured by "Thos. Medella Co." of Saint Paul and further, that the preparation was helpful for the six conditions listed above. The label also indicated that the price for an eight-ounce bottle of the red liquid was \$1.50.

After the customer had received a haircut and scalp massage, he handed Medella a ten dollar bill and received back from him \$3.50 and a bottle of "Cahcetula." The customer protested this and, after the ensuing argument, Medella took back the bottle and returned two dollars more to the customer. However, when the matter was reported to the State Board of Barber Examiners, Medella was persuaded to refund an additional two dollars to the customer and to give him back the bottle of "Cahcetula." When the case was

brought to the attention of the Minnesota State Board of Medical Examiners, a criminal complaint was immediately filed against the defendant. On May 10, 1957, the Saint Paul City Council, after a hearing, revoked Medella's barber shop license because of his conviction in Saint Paul Municipal Court of the offense described above.

SAINT PAUL MAN SENTENCED FOR ABORTION ATTEMPT

Re: State of Minnesota vs. Frank J. Urman

On April 30, 1957, Frank J. Urman, forty-six, 301 Walnut Street, Saint Paul, was sentenced by the Hon. Levi M. Hall, Judge of the District Court of Hennepin County, to a term of not to exceed two years in the State Reformatory for Men at St. Cloud, pursuant to his plea of guilty to an information charging him with the crime of attempted abortion, which he had previously entered before Judge Hall on March 27, 1957. However, Judge Hall then stayed the execution of the sentence for a period of two years and placed the defendant on probation during that time with the Hennepin County Probation Office. At the same time, after dismissing a similar charge which had been placed against the defendant's mother in connection with the case, Judge Hall cited her age, physical condition and previous good record, as his reasons for doing so.

Urman was arrested in a Minneapolis hotel room on March 20, 1957, after the Minneapolis Police Department had received information that an abortion was to be performed there. The investigation which was conducted in connection with the case revealed that a thirty-five-year-old Fargo, North Dakota, housewife had paid Urman \$150.00 to have an abortion performed by his mother. The evidence also indicated that the Fargo woman, while riding in a taxicab from Saint Paul to Minneapolis, had made inquiry of the driver as to whether he knew where she could obtain an abortion. The driver made a notation of the woman's name and the place where she was staying in Minneapolis, and she was subsequently contacted there by Urman, who was employed as a dispatcher by a Saint Paul Cab company. The Fargo woman was lying on the bed waiting to be aborted when the police entered the Minneapolis hotel room, but since the actual performing of the abortion had not yet been started, Urman was not charged with the crime of abortion but with the lesser offense of attempted abortion.

Meetings and Announcements

NATIONAL

American Congress of Physical Medicine and Rehabilitation, thirty-fifth annual scientific and clinical session, Los Angeles, September 8-13, 1957.

American Association of Rehabilitation Therapists; Association for Physical and Mental Rehabilitation; Association of Medical Directors and Co-ordinators, Chicago, July 7-12.

First American Congress on Legal Medicine and Law-Science Problems (replacing the annual Chicago Law-Science Short Course), Hotel Morrison, Chicago, Illinois, July 8-13 and 15-20, 1957. Conducted by the Law-Science Institute of the Schools of Law and Medicine, The University of Texas, Austin, Texas. Hubert Winston Smith, M.D., Professor of Law and Legal Medicine, Director, the Law-Science Institute, University of Texas (also Director, The First American Congress of Legal Medicine and Law-Science Problems).

Midwest Cardiac Conference, Iowa State University Hospitals, Iowa City, Iowa, October 3-5, 1957.

Ninth Postgraduate Assembly in Endocrinology and Metabolism, Medical College of Georgia, October 21-25, 1957.

Symposium on Tuberculosis and Other Chronic Pulmonary Diseases, Saranac Lake, New York, July 8-12, 1957. Sponsored by the American Trudeau Society, Saranac Medical Society, Adirondack Counties Chapter of the New York State Academy of General Practice. Write P. O. Box 11, Saranac Lake, New York.

INTERNATIONAL

Congress of International Society for Cell Biology, St. Andrews, Fife, Scotland, August 28-September 3. Prof. H. G. Callan, Bell Pettigrew Museum, The University, St. Andrews, Fife, Scotland.

Congress of International Society of Orthopedic Surgery and Traumatology, Barcelona, Spain, September 16-21. International Society of Orthopedic Surgery and Traumatology, 34 rue Montoyer, Brussels, Belgium.

Congress of International Society of Surgery, Mexico City, Mexico, October 27-November 2. Dr. L. DeJardin, 141 rue Belliard, Brussels, Belgium.

Fourth International Poliomyelitis Conference, Geneva, Switzerland, July 8-12. Registration deadline, April 1. Fourth International Poliomyelitis Conference, Secretariat, Hotel du Rhone, Geneva, Switzerland.

Inter-American Congress of Pan American Medical Association, Mexico City, Mexico, November 18-22. Dr. Joseph J. Eller, 745 Fifth Avenue, New York 22, New York.

International Congress of Clinical Pathology, Brussels, Belgium, July 15-20. Prof. M. Welsch, Universite de Liege, 32 Blvd. de la Constitution, Liege, Belgium.

International Congress of Dermatology, Stockholm, Sweden, July 31-August 6. Dr. C. H. Floden, Karolinska, Sjukhuset, Hudkliniken, Stockholm 60, Sweden.

International Congress of Electroencephalography and Clinical Neurophysiology, Brussels, Belgium, July 21-28. Dr. R. G. Bickford, Mayo Clinic, Rochester, Minnesota.

International Congress of Neurological Sciences, Brussels, Belgium, July 21-28. Dr. Pearce Bailey, National Institutes of Health, Bethesda 14, Maryland.

International Congress of Neurosurgery, Brussels, Belgium, July 21-28. Dr. William B. Scoville, 85 Jefferson Street, Hartford, Connecticut.

International Congress of Neuropathology, Brussels, Belgium, July 21-28. Dr. Ludo J. Bogaert, 47 rue de l'Harmonie, Antwerp, Belgium.

International Congress of Nutrition, Paris, France, July 24-29. Congress International de Nutrition, 71 Blvd. Pereire, Paris 17e, France.

International Gerontological Congress, Merano-Bolzano, Italy, July 14-19. Segreteria, Quarto Congresso Internazionale de Gerontologia, Viale Morgagni, 85, Firenze, Italy.

International League Against Epilepsy, Brussels, Belgium, July 21-28. Dr. Radermecker, Institut Bunge, 59 rue Philippe Milliot, Berchem, Antwerp, Belgium.

International Symposium on Medical-Social Aspects of Senile Nervous Diseases, Venice, Italy, July 20-21. Secretariate, Viale Morgagni 85, Firenze, Italy.

Neuroradiologic Symposium, Brussels, Belgium, July 21-28. Professor Melot, Hôpital Universitaire St. Pierre, Brussels, Belgium.

Pan-Pacific Surgical Association, seventh congress, Honolulu, Hawaii, November 14-22, 1957. Write Dr. F. J. Pinkerton, director-general of the Pan-Pacific Surgical Association, Room 230, Young Building, Honolulu, Hawaii.

CONGRESS OF LEGAL MEDICINE AND LAW-SCIENCE PROBLEMS

The First American Congress of Legal Medicine and Law-Science Problems will be conducted by the Law-Science Institute of Austin, Texas, at the Hotel Morrison, Chicago, Illinois, from Monday, July 8, to Saturday, July 13, inclusive, and Monday, July 15 to Saturday, July 20, 1957, inclusive, with the aid and co-operation of the Law-Science Academy of America and the Law-Science Foundation of America.

In Memoriam

PAUL I. CARMAN

Dr. Paul I. Carman, former Saint Paul physician, died March 25, 1957, in Cincinnati, Ohio. He was sixty-seven years old.

Dr. Carman, an eye, ear, nose and throat specialist, retired from practice in 1940.

He had been a member of the Ramsey County Medical Society, the Minnesota State Medical Association and the American Medical Association.

He is survived by his wife, Blanche, and an uncle, the Reverend Marcus J. Simpson, Portland, Connecticut.

W. Z. FLOWER

Dr. W. Z. Flower, pioneer physician of Gibbon, Minnesota, died April 23, 1957. He was ninety-five years old.

Dr. Flower practiced medicine for almost sixty years, forty of which he spent in Gibbon. At the time of his death, he was living in Minneapolis with a daughter.

In 1952 the citizens of his home town paid tribute to him with a "Dr. Flower Day."

Dr. Flower graduated from the University of Illinois, Chicago, in 1887. He spent some years practicing in Minneapolis—from 1921 to 1941.

He had been a member of the Camp Release Medical Society, the Minnesota State Medical Association and the American Medical Association.

Survivors include his daughter, Mrs. Leroy Muldner, Mound, Minnesota; seven sons, Don and Franklin, Los Angeles; Oliver, Detroit; Hiram, James, Harold and Clarence, Minneapolis, five grandchildren and one great-grandchild.

CLAUDE B. LEWIS

Dr. Claude B. Lewis, long-time head surgeon at St. Cloud Hospital and brother of the late author, Sinclair Lewis, died April 20, 1957. He was seventy-eight years old.

Born in Ironton, Wisconsin, Dr. Lewis moved at an early age to Sauk Center, where his father practiced medicine for many years. He attended the University of Minnesota and graduated from Rush Medical College, Chicago, in 1903.

Dr. Lewis began practicing medicine in St. Cloud in February, 1905, and continued there until he went into partial retirement in 1949. He was primarily responsible for the establishment of the St. Cloud School for Nurses.

During the first years of his half century of practice, Dr. Lewis was associated with Dr. J. B. Dunn. Then for some years he worked with Dr. M. J. Kern and later for many years he was a member of the Lewis-Stangl Clinic in association with Dr. P. E. Stangl, Dr. Fred H. Stangl, and Dr. William L. Freeman. After his partial retirement, he maintained an office with Dr. W. B. Richardson and C. S. Donaldson. At this time, he also traveled extensively with his author-

brother. Dr. Lewis wrote extensive descriptions of his many trips all over the world and gave colorful lectures.

Dr. Lewis was a charter member and former president of the St. Cloud Kiwanis Club and a member of the First Presbyterian Church. He also belonged to the Stearns-Benton County Medical Society, the Minnesota State Medical Association and the American Medical Association. He was a member of the State Association's "50 Club" group. Dr. Lewis belonged to Sigma Xi, honorary science society, and Alpha Kappa Kappa medical fraternity.

Survivors include his wife, Helen; a son, Freeman, New York City; two daughters, Virginia, San Francisco, and Mrs. Robert Agrell, Excelsior, Minnesota.

MERRIAM GERARD FREDRICKS

Dr. Merriam G. Fredricks, Duluth dermatologist, died May 1, 1957. He was forty-four years old.

A native of Crookston, Minnesota, Dr. Fredricks received his medical education at the University of Minnesota. He interned at Milwaukee County Hospital, Wauwatosa, Wisconsin, and received his master of science degree in dermatology and syphilology from the University of Minnesota.

At the time of his death, Dr. Fredricks was on the staff of the Duluth Clinic. He was also on the staffs of Minneapolis General and University Hospitals, Minneapolis.

He had been a member of the Hennepin County Medical Society, the St. Louis County Medical Society, the Minnesota State Medical Association and the American Medical Association.

PAUL D. McCARTY

Dr. Paul D. McCarty died suddenly at his home on Birch Point, Lake Vermillion, Tower, Minnesota, April 24, 1957. He was seventy-three years old.

Dr. McCarty was born in Rolling Prairie, Indiana. He graduated from Rush Medical College, Chicago, and interned at Cook County Hospital. He was a pioneer physician in the northern Minnesota mining country, as he settled in the Biwabik district in March, 1908. He was practicing at Babbitt during the first experimental taconite development from 1920 to 1924. From 1924 to 1944, he practiced in Ely, Minnesota. He was then incapacitated by a stroke and retired from active practice.

Dr. McCarty was a member of the St. Louis County Medical Society, the Minnesota State Medical Association and the American Medical Association.

He is survived by his wife, Frances; a daughter, Mrs. Harold A. Balsley, Madison, Wisconsin; two sons, Paul D., Jr., Silver Bay, Minnesota, and Eugene F., Summerville, South Carolina, and seven grandchildren.

(Continued on Page 456)

Woman's Auxiliary

NATIONAL CONVENTION HELD IN NEW YORK

The Woman's Auxiliary to the American Medical Association held its thirty-fourth annual convention in New York City, June 3-7. Minnesota was honored to be represented by its former state president and past national president, Mrs. Harold F. Wahlquist, Minneapolis, who installed the new national officers at the morning session, Thursday, June 6.

Headquarters for the sessions was the Hotel Roosevelt. Minnesota delegates attending the meeting attended a variety of worthwhile and interesting sessions. Included among the guest speakers were AMA President Dwight H. Murray, President-elect David B. Allman, Dr. Howard A. Rusk, chairman of the department of physical medicine and rehabilitation of New York University Bellevue Medical Center, and Professor Allen R. Foley, professor of history, Dartmouth College, whose topic was "Vermont Humor."

NEWS FROM THE COUNTY AUXILIARIES

Freeborn County

The Freeborn County medical auxiliary elected new officers at a dinner meeting at the Hotel Albert in Albert Lea, April 18. Mrs. A. G. Sherman was elected president; Mrs. Darwin Holian, vice president, and Mrs. Charles Wilcox, secretary-treasurer. All are from Albert Lea.

Hennepin County

The annual Cotton Carousel sponsored by the Hennepin County group was an outstanding event again this year. It was held two days, April 24 and 25, in Dayton's Sky Room, Minneapolis. Proceeds went to sixteen charitable organizations throughout the city and state. Mrs. Russell Lindgren and Mrs. Harold Noran, Minneapolis, were co-chairmen.

Mower County

Mrs. L. P. Howell, president of the state auxiliary, and Mrs. H. F. Polley, regional adviser, both of Rochester, were guests at a recent meeting of the Mower County Auxiliary. Mrs. Wallace Anderson was hostess. Mrs. Howell told of her work as state president and a movie on AMEF was presented.

Ramsey County

A colorful fashion festival was held March 22 in the Continental Room of the Hotel Saint Paul. Sponsored by the Ramsey County Auxiliary, the affair featured fashions by Rosen-Engelson, Saint Paul. Schiek's Sextet entertained during the intermission. Mrs. H. F. Schroeckenstein was general chairman.

On March 25, a "What's Cooking in Our Town"

workshop was held at the Hotel Lowry. It was sponsored by the Inter-Club Council, of which the Ramsey County Auxiliary is a member. Problems discussed included aging citizens, civic development, health, and educational television.

Winona County

Mrs. Carl Heise was elected president of the Winona County Auxiliary at a recent business session which followed a joint dinner with the medical society at the Hotel Winona. She succeeds Mrs. R. H. Wilson.

Other officers named were Mrs. John Keyes, vice president; Mrs. Warren Haesly, secretary; Mrs. Roger Hartwich, corresponding secretary, and Mrs. Charles Rogers, treasurer. The group also voted to donate a sum to AMEF and made plans to participate in the "Magazines for Friendship" project. On April 18, the group met to sew at Lake Park Lodge. Mrs. Howard Satterlee, Lewiston, and Mrs. P. A. Mattison were hostesses.

IN MEMORIAM

HERMAN J. WOLFF

Dr. Herman J. Wolff, Saint Paul physician, died April 19, 1957. He was fifty years old.

Dr. Wolff graduated from the University of Minnesota medical school in 1930 and later was a graduate fellow of the Mayo Foundation at the University. He was an associate professor of internal medicine at the University of Minnesota, a fellow of the American College of Physicians, a diplomate of the American Board of Internal Medicine, president-elect of the Minnesota Pathologic Society, and past chief of internal medicine at Miller Hospital, Saint Paul.

He was also on the staffs of St. Joseph's, St. John's, St. Luke's and Ancker Hospitals, Saint Paul.

A member of the Ramsey County Medical Society, he also belonged to the Minnesota State Medical Association and the American Medical Association.

He is survived by his wife, Ruth; two sons, Richard and John; a daughter, Elizabeth, and a brother, Benno, all of Saint Paul.

The most unfortunate feature of tuberculosis in elderly persons is that it usually has no distinctive symptom. The cough, sputum, dyspnea, slight dyspepsia and a general feeling of lassitude are all put down to increasing years. It is only when sudden pain or hemoptysis occurs that the patient becomes alarmed and seeks advice. It is then that advanced, old-standing disease is found, and the damage done from the wide distribution of tubercle bacilli from this focus of infection over a number of years can be visualized.—F. R. G. HEAF, M.D., *J. Royal Inst. Pub. Health and Hygiene*, November, 1955.

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SEARLE

General Interest

Dr. Herschel Cope, who recently completed his three-year residency in obstetrics and gynecology at the University of Minnesota Hospitals, has rejoined the staff of the Lenont-Peterson Clinic in Virginia.

* * *

Newly elected staff officers of the Virginia Municipal Hospital include **Dr. David Richter**, chief-of-staff, **Dr. Herschel Cope**, vice chief-of-staff, and **Dr. J. J. McKenna**, secretary.

* * *

Dr. Bradley Ruth has joined the anesthesiology staff of St. Luke's Hospital, Duluth.

* * *

Dr. M. M. Fifield, Duluth, was recently certified by the American Board of Urology.

* * *

Dr. A. J. Henderson, Ramsey County Coroner, gave a talk at the monthly meeting of the St. Croix-Pierce County (Wisconsin) Medical Society, at Richmond, Wisconsin, Tuesday, April 16, 1957, on the subject, "Work and Duties of a County Coroner."

* * *

The Olmsted Medical Group, Rochester, has moved to new quarters in Miracle Mile where complete x-ray and laboratory facilities are available. **Drs. Harold A. Wente** and **J. R. Flanary** say the move was necessary to relieve crowded conditions in their previous quarters.

* * *

Among the visiting faculty members at the institute on mental retardation held at the University of Minnesota Center for Retardation, April 11 and 12, was **Dr. Haddow M. Keith**, of the Section of Pediatrics, Mayo Clinic, Rochester. The institute, conducted mainly for Minnesota public health nurses, was jointly sponsored by the Minnesota Department of Health.

* * *

Dr. Leo G. Rigler, head of the University of Minnesota department of radiology, has resigned, effective June 30, to become consultant at Cedars of Lebanon Hospital in Los Angeles, California. He will also teach on a part-time basis, at the University of California Medical School in Los Angeles. **Dr. Rigler** came to the University of Minnesota in 1927, where he served successively as associate professor, professor, and finally, since 1935, chief of the department of radiology.

* * *

Dr. Edgar V. Allen, internist of the Mayo Clinic and professor of medicine in the Mayo Foundation, who is also president of the American Heart Association, spoke on April 10 at the annual dinner of the Iowa Heart Association in Des Moines. His subject was "The Research Program of The American Heart Association."

Dr. Allan spoke before the Los Angeles County Heart Association in Los Angeles, California, on May 15 on "The Importance of Research." On May 17 he spoke to members of the California Heart Association at San

Diego on "The American Heart Association: Its Aims and Accomplishments."

Dr. Allen was in New York City on May 20, 21 and 22 to attend meetings of the budget committee, the policy committee and the nominating committee of the American Heart Association in his capacity as president of the organization.

* * *

The recently incorporated Minnesota Epilepsy League has announced the appointment of the following members to its medical advisory board: **Dr. A. B. Baker**, director of the division of neurology, and **Dr. Frank Morrell**, head of the adult seizure clinic, University of Minnesota Medical School; **Dr. V. Richard Zarling**, neurologist, Minneapolis; **Dr. Paul Ellwood, Jr.**, department of pediatrics, University of Minnesota Hospitals; **Dr. W. R. Heilig**, St. Paul pediatrician; and **Dr. George L. Wadsworth**, superintendent of the Cambridge State School and Hospital. Two more medical representatives from the Rochester and Duluth areas, as well as lay members of the board, are still to be appointed.

* * *

Dr. Philip S. Hench, Nobel prize-winning physician from the Mayo Clinic, flew to Sweden on April 12, where he participated in a Symposium on Rheumatic Diseases in Stockholm, April 14-18, sponsored by the Karolinska Institute. **Dr. Hench** spoke on "The Therapeutic and Physiological Effects of the Use of Cortisone in Rheumatic Disease" at a joint meeting of the Symposium and the Swedish Society of Medicine, and he also spoke before a panel on "Psychogenic Rheumatism: Social and Economic Importance."

* * *

Dr. David S. Berkman, a native of Rochester, has joined the staff of the Olmsted Medical Group, returning to Rochester after nine years of practice of internal medicine in Rapid City, South Dakota. **Dr. Berkman** received his M.D. degree in 1944 from the Medical College of Virginia, Richmond, Virginia, and completed his fellowship in medicine at the Mayo Foundation in Rochester.

* * *

Dr. Clyde A. Undine, Minneapolis, attended the annual convention of the American College of Physicians in Boston in early April. While in the east he also visited clinics in New York City and Jersey City.

* * *

On April 8, 1957, the National Ataxia Foundation, a nonprofit corporation to raise funds for research and treatment of ataxia, was organized in Minneapolis. The prime mover in this organization is **Dr. John Schut**, a specialist in neurology and psychiatry, and himself a victim of the disease. He estimates that there are between 10,000 and 20,000 victims of this hereditary disease in the nation. One of the first projects of the foundation will be financed with a \$19,000 grant from the federal government. This money will be allo-

cated over the next two years to the Minneapolis War Memorial Blood Bank for a study of blood groups of ataxia victims.

* * *

The Minnesota Society of Neurology and Psychiatry met at the Mayo Clinic in Rochester, May 4, 1957. Dr. J. G. Rushton spoke on "One hundred fifty years of Nonsurgical Treatment of Trigeminal Neuralgia." Drs. R. W. Hollenhorst, Harold A. Stein, H. M. Keith, and C. S. MacCarty discussed "Subdural Hematoma and Subarachnoid Hemorrhage among Infants and Children." A motion picture on "Periodic Movement Disorders" was presented by Dr. J. R. Brown. "Psychogenic Determinants in Murder: A Study of Six First Degree Murderers and Their Parents" by Drs. G. M. Duncan, S. H. Frazier, E. M. Litin, A. M. Johnson, and Alfred Barron, and "Total Hemispherectomy in the Monkey" by Drs. R. J. White and C. S. MacCarty rounded out the morning program. Following luncheon, Dr. D. W. Mulder reviewed the "History of Lake Pepin: 1650-1850."

* * *

Dr. Gustavus A. Peters of the Mayo Clinic was appointed to the Rochester Board of Public Health and Welfare to fill out the unexpired term of Dr. John A. Paulson.

* * *

After forty-two years of service as professor of public health at the University of Minnesota, Dr. J. A. Myers retired at the close of the school year in June. Five Mayo Foundation faculty members also retired at that time: Dr. Arlie R. Barnes, professor of medicine, with thirty-seven years' service; Dr. Winchell M. Craig, professor of neurosurgery, and Dr. Duncan M. Masson, assistant professor of medicine, each with thirty-six years of service; Dr. Austin C. Davis, assistant professor of medicine, twenty-nine years; and Dr. Robert E. Fricke, associate professor of radiology, twenty-eight years.

* * *

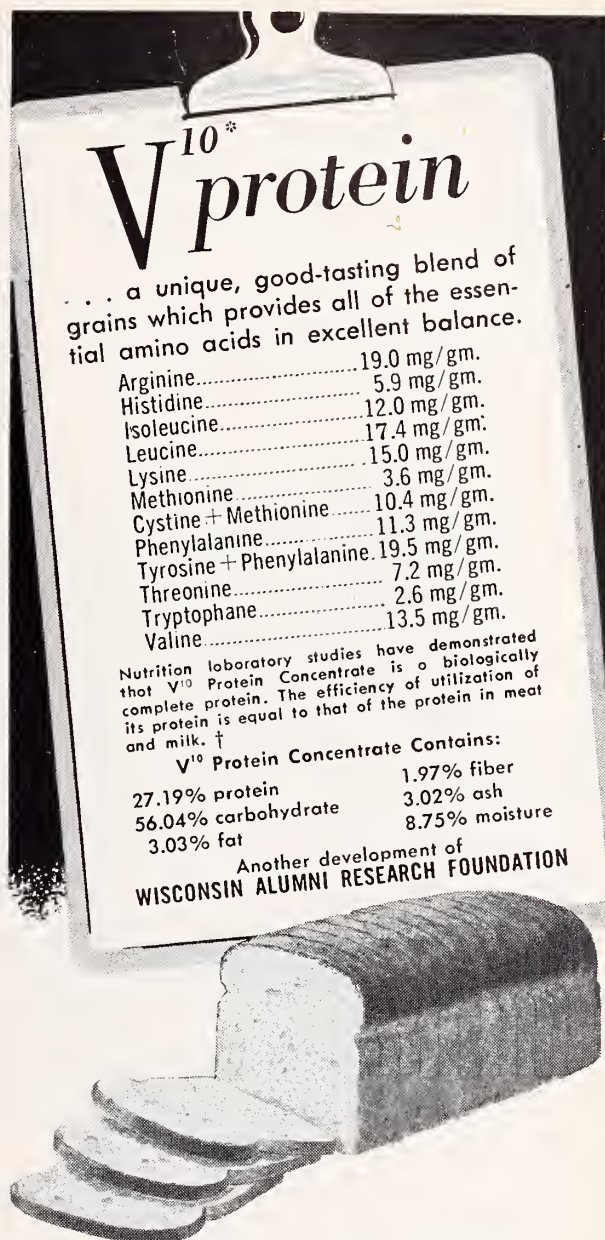
Five Minnesota scientists and physicians have been awarded \$47,100 for heart and blood vessel research, according to a statement from Dr. Robert L. Parker, Rochester, president of the Minnesota Heart Association. The recipients are Dr. Newton Birkhead, Mayo Foundation, and Drs. Richard A. DeWall, Robert L. Vernier, Victor Lorber, and Alan P. Thal, all of the University of Minnesota. This grant is part of a joint support program of the American and Minnesota Heart Associations, under which 155 medical scientists in twenty-nine states will share in \$977,000 worth of awards.

* * *

As part of the observance of Mental Health Week, a workshop was held on May 1 at the Woman's Club, Minneapolis. Dr. Dale C. Cameron, medical director of the Minnesota department of public welfare, was the main speaker; his subject "Things You Should Know About the No. 1 Health Problem."

* * *

Dr. Richard Sartor, a native of Chisholm, who has been practicing in Minneapolis with Dr. Peter Schultz,



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* * *

After spending several years in medical practice in Wadena, Dr. Neil Macheledt has moved to Anoka where he will set up an independent practice.

* * *

Drs. Donald Halverson and J. L. Mills of Winnebago have moved into their newly constructed medical building.

* * *

Dr. B. T. Bottolfson, who has recently completed forty years of medical practice, plans to return soon to the University of Vienna for the fourth time to study recent advances in ear surgery.

* * *

To replace Dr. Leo Rigler, who has resigned to take a position as consultant at Cedars of Lebanon Hospital in Los Angeles, the board of regents of the University of Minnesota has appointed Dr. Harold O. Peterson. In addition to his work as clinical professor of x-ray diagnosis and therapy at the University, Dr. Peterson engages in private medical practice in St. Paul. He will take over his new duties in September.

* * *

At the annual meeting of the Ramsey County Tuberculosis and Health Association, held April 24 in St. Paul, Dr. Herman Kleinman, epidemiologist at the Minnesota Department of Health, spoke on "A Second Look at Tuberculosis."

* * *

Drs. W. D. Coventry, J. B. Moyer, and W. S. Neff, of Duluth, attended the annual meeting of the American College of Physicians in Boston, April 8 to 12.

* * *

Dr. W. S. Pollard is now associated with Dr. Gordon Strewler in the practice of neurologic surgery in Duluth.

* * *

Dr. V. Goldschmidt, pathologist at St. Luke's Hospital, Duluth, was recently certified by the American Board of Pathology.

* * *

Dr. James Nakamura of Deer River was married on March 31 at Bozeman, Montana.

* * *

At the April 23 meeting of the Range Medical Society at the Coates Hotel, Virginia, Dr. James Tuura of Duluth spoke on "The Structure and Management of Hemangiomas."

* * *

Newly appointed medical director of the new Group Health Plan, Inc., of the Group Health organization, is Dr. Abraham Falk of Minneapolis, director of professional services at Veterans Hospital.

* * *

Dr. R. D. Letson has completed his tour of duty in the U. S. Army and has resumed his practice at the Elsey Clinic in Glenwood.

* * *

The American Dermatological Association at its recent convention in Clearwater, Florida, elected Dr. Hamilton Montgomery of Rochester as vice president.

Dr. William P. Sadler, of Minneapolis, represented the University of Arkansas at the inauguration of the Very Reverend James P. Shannon as President of the College of St. Thomas in St. Paul, on Wednesday, May 8, 1957.

* * *

Five University of Minnesota scientists have received research grants totalling \$223,371 from the American Cancer Society. These grants were part of a total of \$4,636,651 allocated for research among 243 scientists in 108 universities and medical centers in thirty-eight states. Dr. Joseph B. Aust will receive \$45,000 to study acquired tolerance in relation to hormone transplantation. Dr. Cyrus P. Barnum will receive \$12,454 to carry on his study of physiologic control of cell growth at the metabolic level. Dr. John J. Bittner's award of \$18,286 will enable him to study further the biologic characteristics of the mouse mammary tumor agents. Experimental studies of cells, viruses and cancer will be conducted by Dr. Jerome T. Syvertson through his allocation of \$139,535. A grant of \$8,096 will enable Dr. Lee W. Wattenberg to carry out a vitamin relationship study.

* * *

Dr. Richard K. Winkelmann of the Mayo Clinic was one of several to receive awards in the American Dermatological Association's 1956 annual essay contest.

* * *

Dr. Harry H. Billings, a native of Pine Island, has begun medical practice in Red Wing, after serving at Veterans Hospital, Minneapolis, and the University of Minnesota. Dr. Billings, a veteran of World War II and the Korean War, holds a degree in physiology and has taken postgraduate training in general surgery.

* * *

A former member of the staff of the Mayo Clinic who is still a member of the board of the Mayo Association, Dr. Dwight L. Wilbur of San Francisco, was named president-elect of the American College of Physicians at its thirty-eighth annual convention in Boston in mid-April. Dr. Wilbur was associated with the Mayo Clinic from 1929 to 1937. His son, Dr. Dwight L. Wilbur, III, is a fellow in medicine at the Mayo Foundation in Rochester.

* * *

The John Phillips Memorial Medal for 1957 was conferred by the American College of Physicians to Dr. Cecil Watson, professor of medicine at the University of Minnesota, in recognition of his research in internal medicine.

* * *

Dr. Russell T. Brown, who has just completed his internship at Miller, St. Paul, has taken over the practice of Dr. Owen Holm of Browerville who recently entered the U. S. Air Force. Dr. Brown will be associated with Dr. A. J. Lenarz.

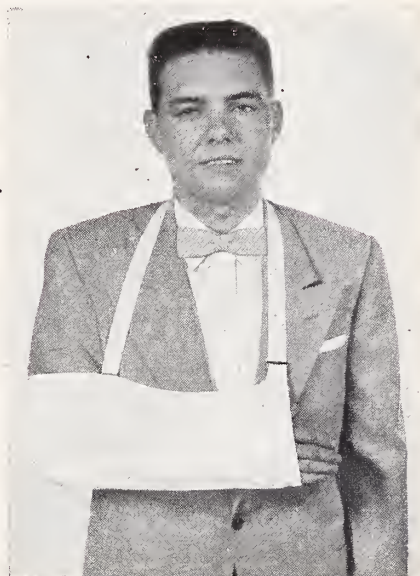
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Dr. Jan H. Tillisch of the Mayo Clinic presided over the twenty-eighth annual meeting of the Aero Medical Association in Denver, Colorado, in early May. Following the meeting Dr. Tillisch went to San Antonio, Texas, to participate in ceremonies marking the be-

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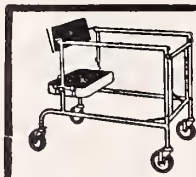
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ginning of a new school of aviation medicine building at Brook Air Force Base. **Dr. E. J. Baldes** and **Dr. Edward B. Waldmann**, of the Mayo Clinic, also participated in the Denver meeting of the Aero Medical Association.

* * *

Dr. E. J. Aulick, formerly of Belgrade, has moved to Paynesville where he is now associated with **Drs. Raymond J. Lindeman** and **Clifford R. Myre** in the Paynesville Clinic.

* * *

On May 10 in St. Paul 148 volunteer workers in Minnesota's state hospitals and institutions for the retarded who have served for five or more years were honored at a dinner at which **Dr. Dale C. Cameron**, medical director of the Department of Public Welfare, spoke. Besides the volunteers who received pins, over 100 organizations were honored for their material contributions or presentation of entertainment at the state institutions.

* * *

A new building is being constructed in Virginia by **Drs. J. S. Siegel** and **H. Wayne Johnston**, associates in a family physician practice. The new structure which will be constructed to allow for future expansion, will have nine examining rooms, minor surgery room, complete x-ray and laboratory units, in addition to the office and reception room.

* * *

Dr. Earl E. Bigler of Perham attended the ninth annual scientific assembly of the American Academy of General Practice in Kansas City, Missouri, in early May.

* * *

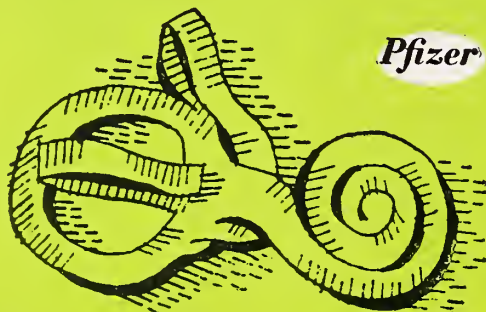
As part of the research program at Mount Sinai Hospital, Minneapolis, **Dr. Ernst Simonson** will review the Russian work and literature on arterial hypertension and coronary heart disease through a grant of \$5,500 from the National Heart Institute.

* * *

Six Mayo Clinic physicians participated in a meeting of the Minnesota Obstetrical and Gynecological Society in Duluth, April 27. **Dr. Elizabeth L. Mussey** discussed "Nonsurgical Treatment of Incomplete Abortion"; **Dr. L. M. Randall** presented a "Twenty Year Survey of Cesarean Sections in Duluth"; **Dr. David G. Decker** spoke on "Carcinoma of the Cervical Stump"; **Dr. Shervert H. Frazier, Jr.**, discussed "Recognition of Psychosomatic Problems in Obstetrics and Gynecology"; and **Dr. George D. Malkasian, Jr.**, and **Dr. James S. Hunter** presented a "Twenty Year Study of Ectopic Pregnancies." **Dr. E. A. Banner** of Rochester is secretary-treasurer of the society.

* * *

Forty-three physicians who are observing their fiftieth year of medical practice were honored on May 14 by the Minnesota State Medical Association. Saint Paul physicians so honored were: **Drs. E. R. Bray**, **Ernest M. Hammes**, **E. M. Jones**, **Carleton G. Kelsey**, and **J. B. Winnick**. Minneapolis doctors cited include: **Drs. Hugo Altnow** (now of Coral Gables, Florida), **Margaret I. Smith** (now of Gardena, California),



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Physicians outside the Twin Cities who received the fifty-year award include: Drs. Harry R. Baker, Hayfield; Carl R. Butturff, Freeborn; Maurice D. Cooper, Winnebago; Olaf J. Hagen, Moorhead; Claude L. Haney and Thorvold J. Jensen, Duluth; Arthur L. Kusske, New Ulm; Frank J. Lexa, Lonsdale; Carle B. McKaig, Pine Island; Edmund M. McLaughlin, Winona; Edward W. Senn, Owatonna; Frederick L. Smith, Rochester; Moses L. Strathern, Gilbert; Walter E. Hatch, Duluth; Henry F. Helmholtz, Rochester; Hilda Luck, Mankato; James C. Masson, Rochester; L. W. Morsman, Hibbing; Arthur H. Sanford, Rochester; O. W. Scholpp, Hutchinson; F. N. S. Solsem, Spicer; W. W. Will, Bertha, and John A. Winter, Duluth.

At the same session Dr. W. W. Will of Bertha, president of the Association in 1936, received the distinguished service award.

* * *

Dr. Albert V. Stoesser, Minneapolis, was the guest speaker on May 4 at the spring meeting of the Washington State Society of Allergy. His subjects were "The Management of Infantile Eczema," "Asthma in Infants and Young Children," and "What Constitutes Good Allergic Care?"

* * *

On April 25, Dr. Robert H. LaBree took over the duties of president of the Duluth Surgical Society from Dr. Karl E. Johnson. Other new officers of the society are Dr. Elizabeth Bagley, vice president, and Dr. Kenneth A. Storsteen, secretary.

* * *

Dr. Bayard T. Horton, staff member of the Mayo Clinic, was recently elected to the University of Virginia chapter of Phi Beta Kappa for his research in the medical field.

* * *

The annual meeting of the Midwestern Section of the American Congress of Physical Medicine and Rehabilitation was held in Rochester, Friday, May 3, with about sixty physicians from an eleven-state area in attendance. Drs. Earl C. Elkins and Paul R. Lipscomb of Rochester held a clinic in connection with the meeting. Dr. Donald J. Erickson, staff member at the Mayo Clinic, is chairman of the midwest section of the organization, and Dr. Gordon M. Martin, also of the Clinic, is secretary.

* * *

Several Duluth physicians participated in the three-day sectional meeting of the American College of Surgeons held in Saint Paul recently. Dr. Frank J. Elias was a member of the Minnesota counseling committee; Dr. Malcolm G. Gillespie was a member of the advisory committee on arrangements; Dr. Owen G. McDonald was a member of a panel group discussing biliary tract surgery, and Dr. Bruce F. P. Williams participated in a panel on conservation of ovarian tissue.

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Dr. Winchell McK. Craig, Rochester, was honored at a special dinner at Georgetown University, Washington, D. C., recently. The engraved certificate presented to him at this dinner was given "in full realization of (his) commanding knowledge in medicine." The award was given by the Association of Military Surgeons of the United States. Dr. Craig was president of this organization in 1952. In 1945 he became the first physician from civilian life to attain the rank of admiral in the history of the U. S. Navy.

* * *

Dr. Marilyn A. Jarvis, staff physician at Hamline University, St. Paul, was nominated for "St. Paul Mother of the Year" for 1957. Dr. Jarvis is the mother of two children, is an accomplished pianist and is active in Girl Scouts and other youth groups.

* * *

Jackson County lawyers and physicians attended a meeting of the Blue Earth Valley Medical Society, April 29, to engage in a panel discussion on problems doctors and lawyers face in personal injury cases. The session was held at the Interlachen Club in Fairmont.

* * *

Mounds Park Hospital, St. Paul, recently observed its fiftieth year of community service. The late Dr. Robert Earl was one of the founders of the institution. Dr. Edward Ostergren, still on the staff, has been associated with the hospital for forty-eight years.

* * *

Mr. Arthur Calvin, Minneapolis, president of the Minnesota Hospital Service Association, died May 5, 1957, at the age of fifty-eight. He was one of the founders of the Association and a charter member of the American College of Hospital Administrators.

* * *

Dr. Frederick M. Owens, Jr., Saint Paul, has been re-elected chairman of the Saint Paul area public health council of the greater Saint Paul Community Chest and Council, Inc. Others on the council include Dr. Ralph L. Olsen, Dr. Samuel Loken, Dr. Edwin C. Burk-lund and Dr. Harold Flanagan.

* * *

Dr. D. G. Mahle, Plainview, spoke at a recent meeting of the Wabasha County chapter of the American Cancer Society.

* * *

Dr. P. E. Hermanson, Hendricks, spoke at a recent meeting of the Renville-Redwood County Medical Society held in Olivia.

* * *

Dr. William A. O'Brien, Minneapolis, spoke on "Recent Advances in the Understanding of Anemia" at the March meeting of the Park Region District and County Medical Society. The meeting was held in Fergus Falls.

Dr. O'Brien also spoke at the blood bank workshop sponsored by the Committee on Medical Technology of the Catholic Hospital Association of the United States and Canada in April.

* * *

Dr. J. H. Aga, who formerly practiced in Mankato, has joined the staff of the Brainerd Clinic.

Drs. M. A. and F. M. Burns, Milan, have a new office location in the remodeled Milan Hotel building.

* * *

Dr. Robert M. Salassa, Rochester, addressed a meeting of the Southwestern Minnesota Medical Society recently.

* * *

Dr. and Mrs. L. H. Wittrock, Watkins, attended the Grand Rounds telecast in Minneapolis in April.

* * *

Dr. P. J. Parker, Hallock, has opened a practice in Staples, Minn. He will be associated with Dr. J. E. Nord in the Lakewood Clinic.

* * *

Dr. Dwight L. Wilbur, a former member of the Mayo Clinic Staff, has been named president-elect of the American College of Physicians. Dr. Wilbur is now located in San Francisco.

* * *

Dr. Warren Pugh, former Duluth physician and chief of police, died recently in Chicago.

* * *

Dr. Gordon Tesch, Elk River, spoke on diabetes at a recent meeting of the East Central Minnesota Medical Society in Cambridge.

* * *

Dr. Brela Gallo, who formerly practiced medicine at Lake Bronson, has moved to Hallock, Minnesota.

* * *

Dr. William R. Watson, Watford City, North Dakota, has set up practice in Sanborn.

* * *

Jane Earl, an Austin High School senior, won the top biology award at the regional science fair held recently in Mankato. She was entitled to exhibit her project in the National Science Fair in Los Angeles in May and expenses for her trip were paid by two sponsoring organizations, the Zumbro Valley Medical Association and the Mayo Association.

* * *


Dr. Kenneth D. Devine of the Mayo Clinic, presented a paper on "Tumors of Sinuses and Orbit" at the New York meeting of the American Medical Association this month.

* * *

"Sudden Deafness of Obscure Origin" was the title of a paper presented at the meeting of the American Medical Association, June 3-7, in New York, by Dr. Erik Hallberg, Ear, Nose, and Throat Section, of the Mayo Clinic.

* * *

Dr. John J. Bittner, director of the University of Minnesota's division of cancer biology, will receive the honorary degree of doctor of medicine and surgery from the University of Perugia, Italy, on July 28. The degree will be conferred in conjunction with the Second International Symposium on Mammary Cancer. While in Europe, Dr. Bittner will lecture at the University of Milan and at the Kantonspital in Zurich, Switzerland. He will also meet with members of the medical school staff at Innsbruck, Austria, and lecture at the Fourth Congress of the International Association of Gerontology




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GENERAL INTEREST

at Merano and Venice, Italy. Dr. Bittner will present three reports on his research during the mammary cancer conference.

* * *

Dr. Clarence J. Rowe, Director of the Hamm Memorial Psychiatric Clinic, Saint Paul, and Mrs. Katherine H. Tinker, Casework Associate of the Saint Paul Family Centered Project, addressed the Canadian Association of Social Workers and the Psychiatrists of the Winnipeg area May 25 on the subject, "The Team Approach in Social Casework and Psychiatric Practice." Dr. Rowe is a clinical assistant professor in the Department of Psychiatry at the University of Minnesota Medical School and secretary of the board of directors of the St. John's University Institute for Mental Health. He was formerly the psychiatric consultant for St. Paul Family Service.

* * *

A limited number of 16 mm. sound kinescopes (films) of the fifth Grand Rounds closed-circuit television program of the Upjohn Company, "Diagnostic and Therapeutic Advances in Liver Disease," are still available. Showing time is ninety minutes. This unabridged film of the April 24 program seen in Minneapolis deals with the differential diagnosis and management of challenging problems in various diseases of the liver. Dr. Cecil J. Watson, University of Minnesota, is a member of the panel of eminent physicians participating in the discussion.

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These films, as well as films of the first four Grand Rounds, are available without charge for showing before any group in the medical or allied professions, including students. To make arrangements for a local showing, write to R. P. Trubey, Head of Professional Advertising Department, The Upjohn Company, Kalamazoo, Michigan.

* * *

The American Medical Association urges all county medical societies planning exhibits for county fairs to make their requests at the earliest possible moment. Anyone desiring copies of the AMA catalog of exhibits for fairs and expositions, is requested to write to George B. Larson, assistant director, Bureau of Exhibits, American Medical Association, 535 North Dearborn Street, Chicago 10, Illinois.

* * *

The annual meeting of the **Southern Minnesota Medical Association** will be held on Monday, September 9, 1957, at Lake City, Minnesota.

* * *

Any physician interested in serving as camp physician for a week or two this summer, is invited to investigate the opportunity at the Tomahawk Scout Reservation on Long Lake near Rice Lake, Wisconsin. The physician's family will be housed in a brand-new "doctor's cabin" complete with indoor plumbing, fireplace, kitchen-dinette, living room and two bedrooms, overlooking the lake. A boat and outboard motor are also at the disposal of the physician and his family.

Two nurses will be on duty at the health lodge to do the routine things related to cuts, bruises, fish hooks and poison ivy under the physician's direction. The "health lodge" is not a hospital but a place for treatment and an occasional Scout may be kept there overnight for observation, but, generally, sick boys go home at the doctor's recommendation.

Further information may be obtained from **Dr. Donald W. Koza**, 1210 Lowry Medical Arts Building, St. Paul 2, Minnesota.

* * *

The **State Medical Society of Wisconsin** is sponsoring a series of circuit teaching programs in postgraduate medical education beginning in July. To make them of the greatest value to practitioners in small communities, the subjects covered are generally in the fields of surgery, obstetrics, pediatrics and internal medicine. A registration fee of \$10.00 is charged for each clinic. This includes the dinner. The July circuit will be held July 16, 17 and 18 in Eau Claire, Ashland and Rhineland. The August circuit will be held August 20 in Delavan, August 21 in Wausau and August 22 in Manitowoc. The September circuit will be held September 10 in Lancaster, September 11 in Racine, and September 12 in Oconomowoc. Circuits will also be held in October, November and January. For further information, write the State Medical Society of Wisconsin, Madison, Wisconsin.

MINNESOTA BLUE CROSS-BLUE SHIELD

An outstanding service was rendered to the 830,000 Blue Shield subscribers, the physicians of Minnesota and Blue Shield by the Honorable E. J. Chilgren, Chairman, and members of the House Tax Committee when they unanimously approved the removal of the 2 per cent tax on money paid Blue Shield by its subscribers from the proposed tax bill on April 12.

Blue Shield was organized by the medical profession of Minnesota to help those with low and modest incomes to secure their medical care at a cost they can afford. Removing from the proposed tax bill the 2 per cent tax on Blue Shield's income from subscribers, as was done by the House Tax Committee, also has the effect of keeping the cost of medical care of those with low and modest incomes within the reach of their pocketbooks.

This action of the Tax Committee is evidence of the Committee's interest in the medical care of the people of the state and the Blue Shield voluntary, prepayment method of providing them medical-surgical-obstetrical care benefits at reasonable cost.

Over 1,108,000 Minnesotans are now enrolled through 420,278 Blue Cross contracts now in effect.

These totals represent a gain of approximately 71,000 participant subscribers and over 29,000 contracts compared to Blue Cross enrollment last year.

The frequency of hospital cases paid is continuing to increase. During the first three months of 1957, 49,737 cases were paid representing 479 cases per year per 1,000 contracts protected compared to 44,991 cases representing 466 cases per year per 1,000 contracts paid during the same period of the previous year.

As in most previous first quarter periods, respiratory illnesses represent the highest number of cases paid. Ranking second is pregnancies. This follows the same pattern as 1956.

However, during the first quarter of 1957, accident cases paid ranked third in number compared to fourth place during the same period of the preceding year of 1956.

More than one-half of the increased Blue Cross incident rate is attributable to the number of accident cases paid. If this trend continues throughout the year, the increase in number of accident cases paid annually would approximate 5,000, amounting to increases in hospital expense of an estimated \$400,000.

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Book Reviews

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

MEDICAL LICENSURE EXAMINATIONS—RYPINS'. Eighth Edition. Walter L. Bierring, M.A.C.P., M.R.C.P., Edin. (Hon.). Former member National Board of Medical Examiners, American Board of Internal Medicine, Iowa State Board of Health; Professor Emeritus, Theory and Practice of Medicine, College of Medicine, State University of Iowa; Secretary, Federation of State Medical Boards of United States; Chairman (Hon.), 1933-1953, American Board of Preventive Medicine, Inc.; Director, Division of Gerontology, Heart and Chronic Disease, Iowa State Department of Health. 964 pages. Price \$10.00, cloth. Philadelphia: J. B. Lippincott Co., 1957.

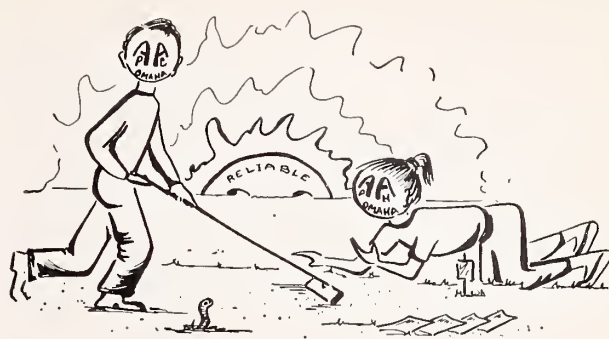
PRACTICAL GYNECOLOGY. Second Edition. Walter J. Reich, M.D., F.A.C.S., F.I.C.S. Attending Gynecologist and Section Chief, Fantus Clinics of the Cook County Hospital; Attending Gynecologist, Cook County Hospital; Professor of Gynecology, Cook County Graduate School of Medicine; Assistant Professor of Obstetrics and Gynecology, Chicago Medical School; Attending Gynecologist and Obstetrician and Former Chairman of the Department, Grant Hospital; Consulting Gynecologist Oak Forest Infirmary, Oak Forest Tuberculosis Hospital, Hazelcrest General Hospital, Fox River Tuberculosis Sanatorium, Geneva Community Hospital And Mitchell J. Nechtow, M.D., F.A.C.S., F.I.C.S. Associate Attending Gynecologist, Cook County Hospital and Fantus Gynecologic Clinic; Associate Professor of Gynecology and Obstetrics, Chicago Medical School; Associate Professor of Gynecology, Cook County Graduate School of Medicine; Attending Gynecologist, Northwest Hospital; Chief of Gynecology and Obstetrics, Norwegian-American Hospital. 648 pages. Illus. Price \$12.50, cloth. Philadelphia: J. B. Lippincott Co., 1957.

THE HAPPY LIFE OF A DOCTOR. Roger I. Lee, M.D. 278 pages. Price \$4.00. Boston: Little, Brown & Company, 1956.

This book can be classed as an autobiography as well as a very good history of medicine of the first half of this century. Dr. Lee's accounting of his personal experience with the new advances and his reactions make it a most interesting type of history to read. To one who has practiced medicine through most of this period, and especially one who served as a medical officer in Europe during the first World War, it has a real meaning and brings to mind many personal experiences and trials.

A younger practitioner cannot but be impressed with the wonderful progress medicine has made, and perhaps be made to appreciate the means at hand to combat disease that were not available a few short years ago.

Dr. Lee was most fortunate in knowing and having known many of the "great in Medicine" of his period and conveys to his readers the personalities of these persons in a very interesting manner.



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ION EXCHANGE AND ADSORPTION AGENTS IN MEDICINE. The Concept of Intestinal Bionomics. Gustav J. Martin, Sc.D. 333 pages. Price \$7.50. Boston: Little Brown and Company, 1955.

This book contains an adequate discussion of the physical and chemical principles involved in ion exchange. The author discusses the clinical application of ion exchange and adsorbing agents.

In the discussion of the chelating agents, those substances that make use of secondary valence forces in order to form loosely bound compounds that may become less permeable to various membranes, the author contributes to the organization of this subject. The review of the literature and remarks concerning the resins and other adsorbing agents, along with the chapter on intestinal bionomics, make the book part of the accumulating body of knowledge on the subject of ion exchange.

The nature of the discussions make the book of stimulating rather than of reference value to the research worker in basic science. The clinical investigator, internist and pediatrician will find a good deal of informative material.

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Classified Advertising

Replies to advertisements with key numbers should be mailed in care of MINNESOTA MEDICINE, 2642 University Avenue, Saint Paul 14, Minnesota.

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WANTED—General practitioner to join six-man group caring for mining company's employees and families. Includes general practice, obstetrics, surgery and industrial work. Salary \$10,000 per year to start. All equipment and car furnished. Living conditions and schools excellent. Location—Black Hills of South Dakota. Immediate opening. Call or write: N. W. Stewart, M.D., Chief Surgeon, Homestake Mining Company, Lead, South Dakota.

WANTED—Young General Practitioner to associate with busy young G.P. in southern Minnesota area. Surgical experience desired. Address E-591, care MINNESOTA MEDICINE.

WANTED—Board or board-eligible OTOLARYNGOLOGIST, qualified in endoscopy, to join clinic of five men, with expectation of becoming full partner in group. Practice limited to Eye, Ear, Nose, Throat. Write: Morsman Clinic, Hibbing, Minnesota.

WANTED—Qualified young surgeon to join clinical group. City in rural Minnesota. Accredited modern hospital. Exceptional opportunity. Address E-578, care MINNESOTA MEDICINE.

WANTED—Physician in internal medicine. Ultra modern, fully accredited, 100-bed hospital. Chiefs of medicine and surgery are Diplomates. Salary up to \$12,900. Quarters available. Apply Dr. Robertson, Manager, VA Hospital, Miles City, Montana.

WANTED—General Practitioner for western North Dakota city, located 25 miles from hospital, population of 1200. Two new schools, parochial and public. Community interested in helping doctor get started in this area. Contact Maurice O'Connell, New England, North Dakota.

WANTED—General practitioner to associate with two other general practitioners in modern clinic, Twin City area. Salary to start and eventual partnership, if agreeable. Address E-584, care MINNESOTA MEDICINE.

WANTED—General practitioner to join busy general practitioner in Northeastern Minnesota. Terms open. Excellent office and hospital facilities available. Address E-589, care MINNESOTA MEDICINE.

EXCELLENT OPPORTUNITY—General practitioner wanted to take over large lucrative practice. Nothing to buy, leaving state permanently. Hospital several blocks from office. Address E-587, care MINNESOTA MEDICINE.

WANTED—Physician with experience in general practice or training in internal medicine to become associated with four-man established clinic. Address E-583, care MINNESOTA MEDICINE.

WANTED—Locum tenens (G.P.) position for one or two weeks during July or August in Minnesota. Write Dr. Harris W. Knudson, 15 Fairchild Circle, Offutt Air Force Base, Nebraska.

PHYSICIAN NEEDED—In Aurora and Hoyt Lakes, Minnesota, to join group of general practitioners and specialists. Partnership after one year. Contact Dr. R. E. Barnes, Aurora, Minnesota.

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Communication

Dear Editor:

On December 22, the *Journal of the AMA* published two appeals which were written by me, on and for the behalf of the refugee Hungarian physicians, in Austria.

When I wrote these letters on November 26 and 30, 218 refugee doctors had registered with us. As of today's date, there are 680.

Several U. S. physicians have written to me, inquiring as to the success of these appeals. I have informed them that the results were rather disappointing.

I received a letter from an American colleague, who writes:

"I am very much impressed with the work that you are doing for our colleagues, and I wish I could help you more. I thought maybe two suggestions could be helpful in receiving more contributions from the doctors here in the U.S.A.

First I think that if it would be possible to send a short mimeographed letter to the secretaries of all County Medical Societies with a request that they should read the letter to the members of the Society at their next meeting and asking a contribution of only \$1.00, nobody would refuse, and many would give much more. This certainly would bring in a large amount of money and maybe the distribution of these letters could be done by each State Medical Society so that your office would have to send these letters to forty-eight societies only, and the rest could be done by the State Societies. I feel that this approach would be more successful than the approach through the journal for the reason that few read your letter in the journal. As a matter of fact, in my community there are thirty doctors and nobody saw this letter.

"My second suggestion would be to get in touch with the Commissioners of Mental Health in each of the states and ask them about the possibilities of employing Hungarian refugee doctors in mental hospitals. The need is great and to my knowledge they were very satisfied with services they received from Hungarian refugee doctors up until now. I, myself, was working for seven months in a mental hospital."

(Name on request)

We would be most grateful to you, if you could publish my appeals in your JOURNAL, and call the attention of your local and regional Medical Societies to the fact

that over 680 Hungarian refugee doctors have, and most of them are still, receiving our aid.

Although the immediate urgency of the situation has been alleviated, there are presently over 450 Hungarian doctors in Austria who wish to return to their practice as soon as a change in the Hungarian political situation permits. In fact, we are urging these colleagues to remain here attending this possibility, for we feel that most of them, should they emigrate to the U.S.A., will encounter considerable difficulty with language and "State Board" requirements. To maintain them here will require our further support for several months to come.

We have found by experience that the best and most direct way to help our Hungarian colleagues is to accord them \$20.00 upon arrival, \$10.00 for every week they remain in Austria, and \$3.00 per day for board and lodging for those colleagues who have been designated to private quarters. We allot \$1.00 per day for each additional member of the doctor's family. There are no organizational or administrative expenses deducted. Every penny received is utilized for direct aid for our refugee Hungarian colleagues.

I am profoundly grateful for your kind humanitarian gesture, which I assure you, will find full recognition in the practical assistance it provides for its needy beneficiaries.

Your cooperation in this matter would be gratefully appreciated.

M. ARTHUR KLINE, M.D.
Executive Secretary,
American Medical Society
of Vienna

Vienna, Austria
February 8, 1957

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Original Contributions

Electrolyte and Fluid Balance in Infant Diarrhea

JAMES L. DENNIS, M.D.
Oakland, California

PERHAPS nowhere else in medicine are the diverse perspectives of the rural practitioner and the academician so well demonstrated as in the approach to the management of diarrhea in infants. To be useful, advances in medical knowledge must be made available to the physician in the field in a form that is both practical and safe. Unfortunately, advances in fluid and electrolyte balance have been reported in specialty journals supported by a mass of details based on the laboratory, the laboratory which sometimes is not available to the general practitioner. This paper will attempt to perform a marriage between the academic and the practical.

To develop understanding, we must review the attitudes that exist. The academician pursues the philosophy that diarrhea is not a disease but rather a symptom with many, many causes; that regardless of the cause, the disturbed or altered physiology and the ultimate death that ensues come as a direct result of the loss of vital body fluids and electrolytes. Hence, it follows that the *primary objective* in the treatment of diarrhea must be the prevention of and the correction of fluid and electrolyte loss. This concept has been augmented by the experience of the medical center specialist who deals almost exclusively with the infant who has a severe diarrhea and who is therefore hospitalized to care for his extreme dehydration and depletion.

In contrast to this, the physician in practice will see many babies with mild diarrhea. He is likely to feel very comfortable in prescribing one of the proprietary antidiarrheal drugs. The academician does not get very enthusiastic about the use of drugs, preferring to rely almost entirely upon precisely calculated fluids and electrolytes.

Why is this? The academician will say that the old theory of intestinal intoxication as advocated by Metchnikoff has not been demonstrated to have clinical significance, and he will quote Best and Taylor to that effect. They observe that most of the proprietary antidiarrheal drugs have been promoted as being intestinal, adsorbing and detoxifying agents.

Insofar as fluids and electrolytes are concerned, the country doctor, his grandfather before him and probably his grandmother, has always prescribed small, frequent amounts of electrolyte fluid in the nature of rice and barley water, skimmed milk, sweetened tea, apple juice and what have you. These are all potent sources of sodium, potassium, chloride and other minerals as well as water. Does the realization of *why* these things are effective make them obsolete? Must we give our young mothers an expensive prescription for an ounce or two of what is essentially salt, sugar and soda? I think not. This leads back to the question of what place, if any, do the antidiarrheal drugs have in the treatment of diarrhea?

Some years ago at the University of Texas, I participated in a study set up and designed to determine whether we could find an answer to this question. The first step was a review of the literature. Papers advocating the use of the proprietary drugs revealed that the children had also received vigorous supporting fluid and electrolyte therapy. On the other hand, in the literature recommending the use of fluids and electrolytes exclusively, there was no instance where any proprietary drug had been given. This posed a nice question.

Realizing that there is a great difference in the clinical problem between mild diarrheas treated in the out-patient clinic and the severe diarrhea treated in the hospital, the study was organized so that in every instance, whether in the outpatient

Presented before the Minnesota Academy of General Practice, Saint Paul, Minnesota, October 17, 1956.
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clinic or in the hospital, the patient received calculated basic fluid and electrolyte requirements. Then in addition, according to a random-choice method, some patients were selected to receive one of the antidiarrheal drugs. One such drug was a multiple or polyamine exchange resin which has since been marketed under the name of Resion.† Omitting the details of the study, we found that the infants with severe diarrhea, with severe dehydration and electrolyte depletion, were not benefited at all by the proprietary drugs. This was not unreasonable when you realize that these babies were usually so sick that they could not tolerate anything by mouth.

On the other hand, we were quite surprised to find that the infants with the milder diarrheas who had been given the polyamine resin along with their basic fluid electrolytes had a shorter recovery period than those who had had only their calculated amounts of fluids and electrolytes by mouth. So it seems logical to conclude that both attitudes may be essentially correct when applied with good clinical judgment.

If a severe diarrhea patient is benefited *only* by appropriate fluids and electrolytes, it behooves doctors in practice, whether in a mountain hamlet or in a university center, to understand some of the basic physiologic principles involved in the management of fluid and electrolyte imbalances in the infant. I should like to review some of the academic concepts, to show why we behave the way we do.

To begin with, what is the difference in diarrhea in an infant and an adult? In general, the disease is the same; the difference is in the patient. To illustrate, take a hypothetical 10-pound baby. This baby contracted acute diarrhea yesterday and is brought into the office today. The "10-pound" baby weighs only 9 pounds today and is severely dehydrated because the loss totals one-tenth of the baby's body weight.

One pound of water is 453 grams, which is equivalent to 453 cc. So a baby who has lost approximately a little less than a pint of water has become severely dehydrated. Mr. Average Adult, weighing 150 pounds, would have to lose 15 pounds or nearly 7,000 cc. (or 7 liters) to experience the dehydration and shock which this baby manifested with the loss of only one pint of fluid.

The same delicate balance holds true when you

put the needle into the baby's vein. The baby who inadvertently gets 400 to 500 cc. too much in a twenty-four-hour period has had dumped into his blood supply the equivalent of 7 liters of excess fluid in the adult.

Most physicians have been taught to describe electrolytes in terms of milligrams percent. In recent years, electrolytes have been discussed in terms of milliequivalents per liter. In practice, do not be too troubled by not knowing the details of this change-over.

The milligram is a unit of weight and, as such, does not convey any idea or imply the amount of potential chemical activity. It is very much like having a pound of feathers or a pound of steel in a sack. They both weight one pound, but anyone would prefer to be hit over the head with the feathers. So we are talking about elements of different powers. Another analogy: we would not invite 1400 pounds of boys and 1400 pounds of girls to a teen-age dancing party. Rather we are interested in the combining power of two oppositely charged elements. They must be equal in numbers. This comes back to the old basic chemical law that in any given solution there must be an equal number of positively charged ions and negatively-charged ions. This is electrical balance or equivalent balance. Actually, there has been no change in the laboratory techniques. The milligram percentage per 100 cc. is determined first and then transposed into milliequivalents by an equation. It is very impressive and necessary in the laboratory research center, but not always practical for the man in practice. Before presenting a simplified approach which can be used anywhere, I want to pursue the physiologic approach a little further.

An infant's weight is 75 per cent liquid: 50 per cent in the form of intracellular fluids, 20 per cent in the interstitial fluids between the cells, and 5 per cent in the intravenous fluid compartment. Only 25 per cent of the body is solid. This is a relatively higher percentage of water than in an adult. As for the chemical composition of these compartments, sodium is the principal cation in the extracellular compartment and chloride is the principal anion. In the intracellular compartment, there is an entirely different "population." Here sodium comprises only 10 milliequivalents of the cation electrolyte content, whereas potassium becomes predominant and preponderantly so. An-

†National Drug Company.

TABLE I. ELECTROLYTES OF BLOOD (EXTRA-CELLULAR FLUID)

Cations (+)	mEq/L.	Anions (—)	mEq/L.
Sodium	142	HCO ₃	28
Potassium	5	Chloride	103
Calcium	5	Proteins	15
Magnesium	5	Organic acid	9
Total	155		155

TABLE III. MILD DIARRHEA—CLINICAL SIGNS

Slight increase in number and fluid content of stools.
Weight loss, less than 5 per cent of body weight.
No gross signs of dehydration.
Retaining oral fluids.
Good renal flow.
Skin turgor normal.
(Treatment: home, office or O.P.D., oral electrolyte fluids.
Adjuncts—antidiarrheal drugs).

ons are principally phosphorus and proteins with essentially no chloride.

This demonstrates that (1) the chemical composition of what we measure in the blood is not at all what we have in the cells; (2) in serum analysis we measure the vascular compartment content, the very smallest source of our fluid electrolyte situation at any given time. Furthermore, a baby who is severely dehydrated to the point of being in shock has a very greatly diminished circulating volume. If this blood is drawn to do the initial determinations, it may be so concentrated that the results have no meaning. The potassium level may be extremely high due to this concentration, while the cellular potassium may be quite depleted. Regardless of the value of laboratory findings, initial therapy must start before the reports come back and must be based entirely on clinical observation and judgment.

Normal electrical balance in the serum (Table I) has 155 milliequivalents positive charges and 155 milliequivalents negative. Theoretically, if we could measure the anions and the cations of all of these elements, we could replace any imbalance that exists with mathematical precision. Actually, this is not possible.

The intracellular compartment (Table II) is entirely different with 195 milliequivalents of anions and cations in a balanced solution but having no correlation to what is measured in the serum.

Now for a simple clinical approach: is the infant mildly, moderately, or severely dehydrated? Since this is basically a clinical problem, not a laboratory problem, let us approach it from the clinical side. The case is one of *mild diarrhea* (Table III) in a baby who has minimal signs, maybe a few loose stools and little or no fever. The skin turgor

TABLE II. ELECTROLYTES OF INTRA-CELLULAR FLUID

Cations (+)	mEq/L.	Anions (—)	mEq/L.
Potassium	140	Organic acids	120
Magnesium	45	Protein	65
Sodium	10	HCO ₃	10
Total	195		195

TABLE IV. MODERATE DIARRHEA—CLINICAL SIGNS

Frequent fluid stools.
Weight loss more than 5 per cent but less than 10 per cent.
Moderate signs of dehydration.
Continued loss of fluid by vomiting and diarrhea, or questionable ability to retain fluids.
Urine output diminished-concentrated.
Skin, hot and dry.
(Treatment: optional—oral or per hypodermoclysis. If home conditions are poor, hospitalize.)

is still good; the baby takes oral fluids. There is no question that this baby can be treated in the office, at home, or in the outpatient department. Frequent sips of some electrolyte fluid are prescribed: one teaspoon of salt and four table-spoons of Karo syrup to one quart of boiling water, or the fluid left from boiling rice or barley with a little salt added.

As for the amount of fluid required, 60 cc. per pound is the minimum daily normal requirement. Prescribe at least this amount by telling the mother to give an ounce every hour, or two ounces every three hours, or three ounces every four hours. It is necessary to give her a definite goal. It does little good to tell the mother to give the baby "all the fluids you can."

Concerning antibiotics in diarrhea, the study previously mentioned showed that the use of polymyxin or neomycin contributed very little to the shortness of the course; although if we watched the stool cultures, they were very dramatically reversed. Judgment is necessary here, too.

Adjuncts such as Resion and the so-called intestinal-adsorbing agents cannot replace electrolytes, but in some manner they appear to reduce the loss of fluids and electrolytes in the mild cases.

The child with *moderate diarrhea* (Table IV) may have a hot, dry skin, moderate fever, a questionable oral intake of fluids, and diminishing urine output. This baby may be vomiting a little. It may begin to look a little toxic. The first question is, "Where do I treat this baby?" If the baby is vomiting or has a poor home situation, it belongs in the hospital because it will be severely dehydrated by tomorrow. If this baby is from a good home and it seems to be able to retain some fluids, send it home and keep in close contact with the

TABLE V. SEVERE DIARRHEA—CLINICAL SIGNS

Dehydration grossly obvious.	
Weight loss 10 per cent or more.	
Pinched, anxious facies.	
Hyperpyrexia, or, shock.	
Loss of skin turgor.	
Anuria.	
(Treatment: hospitalization and intravenous. Fluids mandatory).	

mother. See the baby the first thing in the morning and make use of the "laboratory test"; that is the most valuable of all. *Put the baby on the scale.* A baby who is retaining fluids will have maintained its weight, or gained an ounce or two. The baby who has continued to lose more fluids than it has taken in will have lost an ounce, or two or three; and that may be the only indication for putting the baby in the hospital. That fine, old scale, weighing the baby in pounds, is more valuable than all the electrolyte determinations that can be done at this stage of the game.

Remember the fluid requirement: 60 cc. per pound for mild diarrhea; increased to 80 cc. for moderate dehydration. This may be given to the baby orally if the child is taking oral fluids, or it may be given as a clysis, using the isotonic combination of 2.5 per cent dextrose in water in half normal saline. I would like to point out again that parenteral infections must be treated; the adjuncts may be used—they are optional.

Now we come to the baby we are going to worry about; namely the child with *severe diarrhea* (Table V). This baby may have an extremely high fever, 106° or 107°, or it may have proceeded so far as to be in a state of shock with a subnormal temperature. There is a loss of skin turgor; skin resembling a rumpled towel; sunken eyeballs; central nervous signs; perhaps most significant of all, anuria. For this infant, the hospital and intravenous fluids are *mandatory*. This baby must never be given a clysis. This baby is in peripheral circulatory collapse, hence, will not pick up the fluids or the electrolytes from a clysis. From the standpoint of total fluid requirements, one can very simply remember for severe diarrhea to give 100 cc. per pound per day.

Objectives of therapy must be kept in mind (Table VI). If the baby is in shock, obviously the first thing to do is to treat shock. The next objective is to restore kidney function. These two things are "musts." For shock, inject 10 to 15 cc. per pound of electrolyte fluid or a plasma expander. Why do I say plasma expander? Plasma of

TABLE VI. SEVERE DIARRHEA—PRINCIPLES OF TREATMENT

1. <i>Shock</i> , (restore circulating fluid volume), push i.v. of ½ N.S. in 5% D/W or plasma expander. Give 15 cc. per pound at rate of 5 to 10 cc. per minute.
2. <i>Renal function</i> , (restore renal flow), saline-glucose mixture at 20 drops per minute until urine output established.
3. Restore <i>fluid and electrolyte</i> balance (See text).
4. Periodic re-evaluation of clinical status.
5. Establish oral intake (fluids-electrolytes-calories).

the pooled blood type is fraught with the danger of homologous serum jaundice and I hate to use it; although I must admit that in an emergency with a baby in shock and plasma available, I probably would use it. Follow with a solution of one part saline and two parts 5 per cent glucose water. Why not use normal saline? Remember the milliequivalent values in serum. There are 145 milliequivalents of sodium, and only 103 of chloride, other anions making up the difference on the acid side. With sodium chloride in so-called normal saline, there are 155 milliequivalents of sodium and 155 milliequivalents of chloride. In severe infant diarrhea, the infant usually loses more sodium and relatively less chloride. So to give a solution with equal parts of sodium and chloride adds excess chloride to the serum in a situation in which chloride may be already high.

Another reason for combining the saline solution with the dextrose and water is that in normal saline there is no "free" water, since it is isotonic with normal serum. The extra chloride present must be excreted, hence, would require even more water, which is not available. By giving dextrose and water, we are giving dextrose which will be converted to glycogen, and freeing the water for kidney function.

What about the commercial solutions? Almost every hospital has a pet: Darrow's solution, Hartmann's solution, Butler's solution and so on down the line. None of them is specific and all of them will work in the hands of men who know what they are doing with them. I prefer to teach my residents to think basically in terms of saline solution and glucose and water.

For the first hour, or until the urine output is established, drip this relatively rapidly at 20 drops a minute. When the kidneys are functioning well, add potassium. It requires approximately 2 milliequivalents of potassium per pound per day. (A solution of potassium chloride, in which there are two milliequivalents per cubic centimeter, is available in ampules.†) Some practitioners may prefer

†Abbott Laboratories.

one of the commercially prepared polyionic solutions, using it in place of the saline. However, one part of any balanced electrolyte solution to two parts of glucose and water makes a good safe hypotonic solution.

The problem of the rate of flow to drip the fluid in order to deliver the twenty-four-hour requirement can lead to a good deal of calculating. Actually, one need only take the factor (100) and divide into the total number of cubic centimeters required per day. For a 12-pound baby, needing 1200 cc. per day, the answer is 12 drops per minute (one drop per pound per minute). To be safe, I usually write the order "10 to 12 drops a minute," so it will not go in too rapidly.

Finally, we come to the method of getting the fluid into the baby's veins (Fig. 1). For a number of years, we have advocated scalp vein technique using a .023 gauge polyethylene tubing. This tubing comes already made up. If not, one can easily be made. Take a 23-gauge hypodermic needle, break it off, and put it in the distal tubing. Put a short, blunt, beveled 23-gauge needle in the proximal end and connect to a syringe. Fill it with saline, grasping the needle at right angles with a hemostat. As the needle gets under the skin, an assistant pulls back on the plunger. Once the vein is entered, the blood comes back, and the tubing connected with a Murphy drip. This simple procedure is good only in the small infant. (Remember, once the vein is entered, the greatest danger becomes one of excess fluid.

Admittedly, there are times when it is necessary to cut down on a vein. The most useful site is the superficial saphenous vein at the medial aspect of the ankle. I do not like to cut down, if I can avoid it, for several reasons. First, by putting in either a large-caliber needle or a large-caliber polyethylene tubing with an opening that is patent, one is likely to drown the baby. If the fluid runs too rapidly, it does not take much time to lose the child. Second, infection and phlebitis are quite

common following this procedure. Third, no matter how good the surgeon, a permanent scar is the result.

In conclusion, I would like to recapitulate the

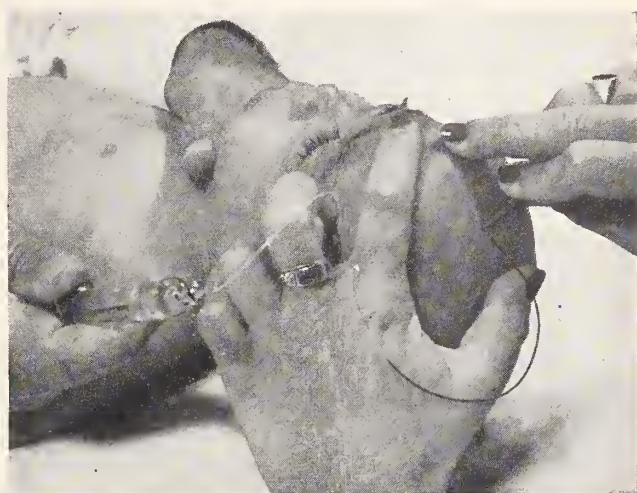


Fig. 1. Needle inserted into scalp vein. Assistant pulls on plunger so that blood enters polyethylene tube when vein entered.

foregoing clinical procedure which is based upon academic concepts, and which can be used by any practitioner anywhere.

1. Classify the dehydration as mild, moderate or severe.
2. Give 60, 80 or 100 cc. of fluid per pound per day, orally, by clysis, or intravenous drip according to severity.
3. Treat shock and establish renal function.
4. Drip in the total fluid requirements.
5. Figure the rate of flow by dividing the total number of cubic centimeters per day by the factor of 100.
6. Once the baby is out of shock, there is no emergency and overhydration constitutes the greatest danger.
7. If the diarrhea is a rare type (e.g. adrenal insufficiency), then the laboratory becomes invaluable as a guide to therapy.

ARTHRITIS FILM RELEASED

A 16 mm. color motion picture on the uses of steroids in the treatment of rheumatoid arthritis has been released for showing to professional groups by the research division of Schering Corporation.

The film reviews the chemistry, physiology and clinical application of the new "Meti" steroid hormones in rheumatoid arthritis and other collagen diseases. It presents the most commonly accepted theories of adrenal corticosteroid therapy and reflects the current knowledge of the subject.

The 25-minute film, which is the fourth in a series

on hormone therapy and the endocrines, was produced by the company's Clinical Research Division and Biochemical Research Department. Three leading rheumatologists and endocrinologists cooperated: Dr. Joseph Eidselsberg, New York; Dr. Abraham Kolodin, Montclair, N. J., and Dr. Evelyn Merrick, Orange, N. J.

The film is available to medical and allied professional groups on loan without charge. "Meti" Steroids in Rheumatoid Arthritis" and other films may be obtained by writing to The Audio-Visual Department, Schering Corporation, Bloomfield, N. J.

The Beck Operation for Coronary Artery Disease

CLAUDE S. BECK, M.D.,
BERNARD L. BROFMAN, M.D.
Cleveland, Ohio

IT IS the general practitioner who sees the patient stricken with a heart attack, and it is he who carries the patient through his illness. As you know, coronary artery disease or angina pectoris is a common disease which kills or incapacitates a large number of people. In many respects it is a more important disease than cancer, because it kills and incapacitates many more people than do all forms of cancer combined. It is so common that some medical cardiologists make light of the disease, but the death toll speaks for itself. The cardiologist often seems to be satisfied with the treatment that he administers to the patient. Both of these reactions produce a feeling of complacency toward this disease and also toward the patient who has it. Instead of being satisfied with treatment of coronary artery disease, we should be critical of and dissatisfied with present day treatment because it leaves so much to be desired.

Limitations of Treatment

No form of treatment cures the disease. No treatment reduces the occlusive process in the arteries; no treatment prevents further development of arterial disease; no treatment restores degenerated myocardium. The electrocardiogram is not treatment of the disease. No medical therapy can change or improve the anatomy of the coronary arteries. Perhaps in the future atherosclerosis of arteries may be prevented, but this cannot be done at present, and the possibility of this accomplishment in the future is remote and should not reduce our dissatisfaction with medical therapy.

Axiom in Coronary Artery Disease

When a coronary artery is narrowed or occluded, the fate of the patient depends upon the amount of blood distal to the stenosis or occlusion. This is a self-evident truth, fundamental in

understanding the disease and essential for effective treatment. It is an understatement to say that this working-principle has been neglected. The electrocardiogram has been of such absorbing interest to the medical cardiologist that the fundamental problem in treatment has been disregarded.

What Happens?

What happens when a coronary artery is narrowed or occluded? Two things may occur: One is the production of electrical currents; the other is the death of muscle. Currents are produced when poorly oxygenated muscle is in contact with well oxygenated muscle. These differences in oxygen content are produced by disease in an artery. We call them oxygen-differentials. Emphasis is placed upon differences in oxygenation; emphasis is not placed upon amount of oxygenated blood delivered to the heart, because a uniformly cyanosed heart does not have these currents. These differentials produce currents which may become strong enough to fibrillate the heart. This is the fatal heart attack. The other thing that may occur after a coronary artery is narrowed or occluded is infarction or death of muscle, due to the inadequate amount of blood reaching the muscle. It is not related to differentials in oxygenation. These are two separate biologic processes, one due to differences in oxygenation, and the other to inadequate blood supply.

There are two modes of death from coronary artery disease. One is due to the fibrillating currents that kill so many people; the other is due to muscle death which ultimately kills the victims by heart failure. The currents are not strong enough to fibrillate the heart and the heart keeps on beating; thus the heart goes from one infarct to another until ultimate failure occurs. These two types of death are different—as though they were produced by two different diseases. Sometimes the heart which seems to be anatomically capable of continued function stops in standstill and does not fibrillate, because the muscle fails to respond to the normal electrical impulse.

Presented to the Minnesota Academy of General Practice, St. Paul, October 17, 1956. From the Western Reserve University, The University Hospitals and Mount Sinai Hospital, Cleveland, Ohio.

We are in an area of "muddy thinking" concerning coronary artery disease. A recent experience will illustrate this. I was a member of a panel and the subject for discussion was "the treatment of myocardial infarction." However, this title was not correct for the discussion that took place. The intent in using the words "myocardial infarction" in the title was not to confine discussion to infarction when something else killed the vast majority of coronary victims. This title and the discussion called forth by this title indicate a conflict in the science. In this panel discussion an attempt was made to define "a mild coronary occlusion." Some of the patients discussed had a mild coronary occlusion and did not live. It was a mild occlusion yet the patient died. This again indicates conflict in the science. An informed society expects something better than this from the medical scientist.

Trigger

Poorly oxygenated muscle in contact with well oxygenated muscle is a condition that gives rise to electric currents. These currents may be strong enough to fibrillate the heart and produce the fatal heart attack. We refer to this condition as "pink and blue" in the heart. It accounts for tens of thousands of deaths yearly in this country, on the golf course, shoveling snow, watching television, or during sleep. In many of these victims, the heart anatomically is capable of continued function for years were it not for the current that destroyed the normal impulse. The death factor is often a small factor; it need not be an overwhelming destruction of the heart. The death factor may be preventable and it may be reversible. The term "trigger" is applied to a localized area of ischemia. It is readily produced experimentally by placing a ligature on coronary arteries. After an ischemic area of muscle has been produced, any addition or subtraction of blood in reference to the trigger makes a difference in what occurs. If a little additional blood is made available to the trigger, then its destructive power is reduced; if the ischemia is made more severe by further reduction in blood supply, then it becomes more destructive.

The Trigger's Blood

If the trigger is a small area of muscle, a few drops per minute or one or two cubic centimeters per minute help a great deal. This was shown

in our experimental laboratory. When the descending ramus of the left coronary artery is ligated at its origin in the dog, 300 c.c. per hour or 5 c.c. per minute made available to the muscle formerly supplied by this artery will prevent fibrillating currents. For the circumflex artery, 390 c.c. or 6.5 c.c. per minute will prevent fibrillation. These amounts of blood will not prevent infarction but they will prevent fibrillating currents. For smaller areas of muscle, smaller amounts of blood are protective.

Segmental Anatomy of the Coronary Arteries

Each coronary artery and each branch of a major coronary artery supplies a discrete segment of muscle. The discrete nature of this anatomy makes the heart vulnerable to small alterations in blood supply, but there is some variation in this anatomy. About 9 per cent of humans have some connections between arteries or between branches of arteries. These people were probably born with these intercoronary communications; they are the people who are more likely to survive coronary occlusion because their hearts are protected. Figure 1, A and B, shows two normal dog hearts. The segmental nature of the arteries is shown; the communications between arteries are few. Intercoronary communications can be produced by surgical operation. These communications are illustrated in C and D of Figure 1, compare with A and B. These hearts are protected by these new channels produced by operation.

The Beck Operation

The operation is a simple one and consists of four steps. The first is the passage of a ligature around the coronary sinus about 1 or 2 cm. from its ostium in the auricle, constricting the sinus down to a lumen of about 3 mm. This narrowing of the sinus accomplishes certain favorable and unfavorable results. It brings about somewhat greater extraction of oxygen from the venous blood, which normally is already greatly reduced. The mild venous stasis reduces oxygen differentials in the presence of arterial occlusion, and this probably protects the heart with coronary disease. It also produces intercoronary channels. On the other hand, increased capillary pressure may reduce total coronary artery inflow. Our opinion is that this step in the operation makes it more effective. If the sinus is hard to ap-

proach at operation, as in cases with cardiac enlargement, this step is omitted. However, only rarely is this the case. We have seen no ill effects from it at operation.

The second step consists of abrasion of the lining of the parietal pericardium and the epicardial surface of the heart. This produces inflammation, with resultant intercoronary channels. Necrotizing chemicals such as carbolic acid should not be used for this purpose.

The third step consists of the application of about 0.3 gm. of coarsely ground asbestos to the surface of the heart, producing a mild inflammatory reaction. Asbestos is the most effective and least irritating substance that we have tested.

The fourth step is to bring the mediastinal fat into contact with the heart so that it can act as a graft upon the heart. Each step in this operation contributes something to the final result. The operation itself is tolerated remarkably well. It requires approximately one hour to perform, but it should be emphasized that there is no need for haste during the operation. In no instance has the duration of operation contributed to any untoward complications.

Effectiveness of This Operation

Figure 1 shows the effectiveness of this operation. Operation produces intercoronary arterial communications so that a blood cell, once it enters the coronary system, can go where it is needed most by the heart. One of the tests that we use to measure the effectiveness of these intercoronary channels was the Mautz-Gregg backflow test. This test is done by ligating the circumflex artery. It is then cut distal to the ligature and the open end of the artery is cannulated. The amount of blood that comes out of this artery is the amount available to the muscle beyond the ligature. The average backflow in seventy normal dogs is 3.8 c.c. per minute or 228 c.c. per hour. Average backflow in forty-one operated dogs is 8.5 c.c. per minute or 510 c.c. per hour. Operation adds an average of 282 c.c. per hour to the circumflex area beyond the occlusion. It is comparable to a transfusion of 282 c.c. of blood added to the quantity already present. This blood is available to meet the crisis of the occlusion. There is no evidence, no scientific measurement, to show that any of the available medical measures add (or subtract) a single drop of blood to ischemic muscle. In dogs

undergoing one-step ligation of the descending ramus of the left coronary artery at its origin, the 70 per cent mortality in normal dogs was reduced to 26.6 per cent by operation. This decrease of 43.4 per cent is due to reduction of oxygen differentials by intercoronary channels. The process of infarction was reduced 60 to 70 per cent in size by this operation. These results have been well tested in the laboratory.

Selection of Patients for Operation

1. *Prophylactic Group.*—Up to the present time operation has not been done as a prophylactic measure, but inclusion of this group is under consideration. It is illustrated by a man, aged forty years, who lost his father, an uncle and two brothers at the age of forty-one to forty-five years. This man had no symptoms of the disease. The question he put to us was whether he should be protected by the operation now, when the risk of operation was slight and before occlusion developed. Operation was advised.

2. *Coronary Insufficiency. Angina Pectoris.*—Operation is advised when the diagnosis is made. The risk is small.

3. *After One or More Infarcts.* The interval between operation and the last infarct should be at least six months. This gives time for repair and for the disease to stabilize so that the condition after operation can be compared to the condition before operation.

Contraindications

1. *Signs of Congestive Heart Failure.* These include dyspnea at rest, rales in the lungs, and peripheral edema.

2. *Marked Enlargement of the Heart.* This indicates extensive myocardial damage, a condition that can scarcely be helped by operation and the risk is definite.

3. *Progression of Symptoms.* Operation is delayed until the clinical course becomes stabilized. If the stenosing disease is rapidly progressive, operation may transform an impending medical mortality into an evident surgical mortality.

Clinical Results

Of 100 patients who were followed six months to five years after operation and who could be evaluated, there was no pain in forty, less pain in forty-eight, and a total of 88 per cent improved.

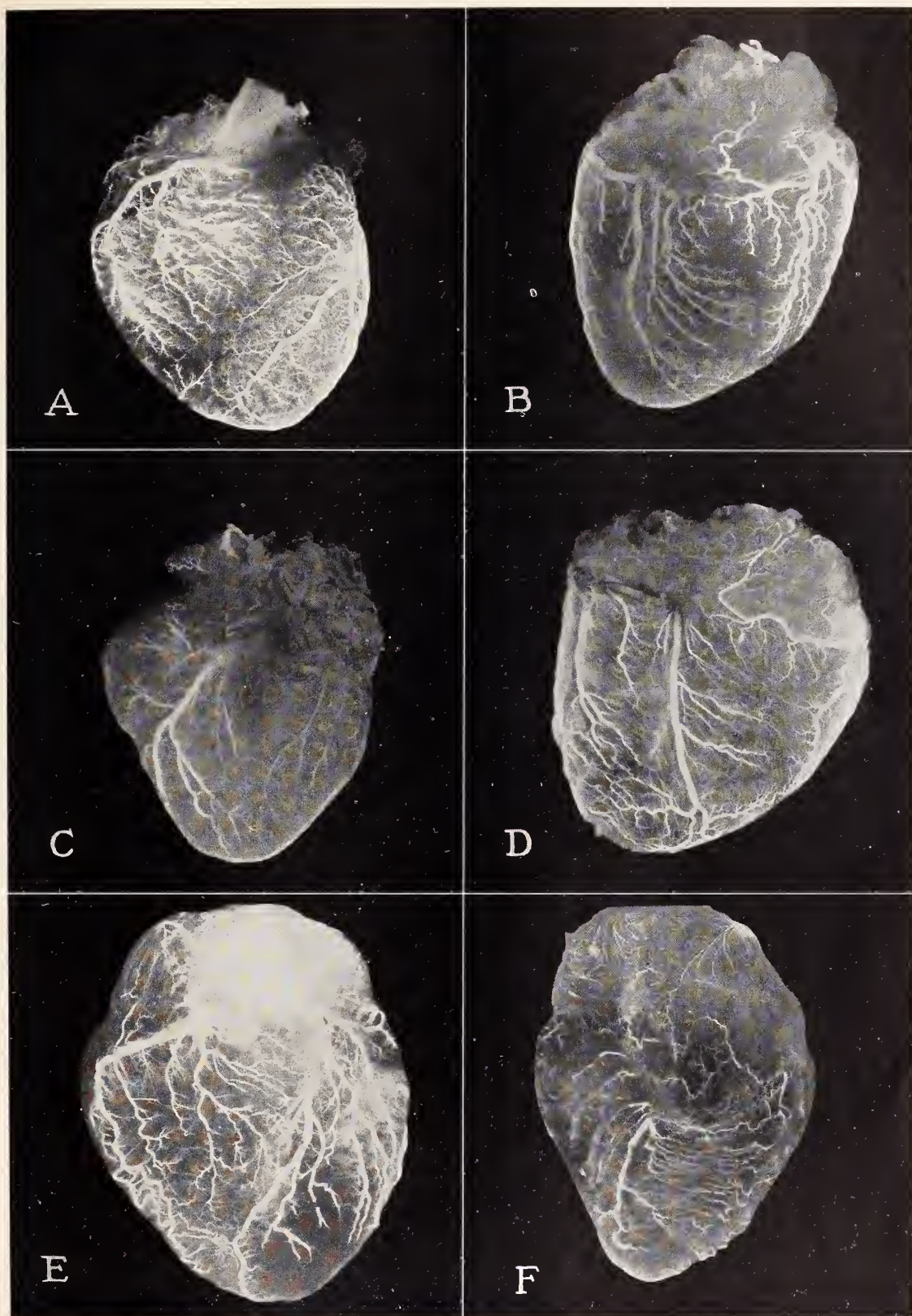


Fig. 1. The coronary arteries were injected. A and B are normal dog hearts. Note the segmental distribution of the coronary arteries and their branches. Communications between arteries are sparse. C and D are dog hearts after operation. Note the intercoronary channels. These are protected hearts. E and F show a human heart. This patient had been incapacitated, but he worked for nine months without pain after operation. His pain returned and he died in three months. Note the intercoronaries. Three adjacent vessels are occluded in F on the left side of the photograph. Probably this area produced pain and fibrillating current because it is poorly vascularized. This is classified as a good or excellent result from operation. Operation does not pretend to cure coronary artery disease.

There were thirty-four better able to work without limitation, and fifty-six better able to work with moderate limitations, or 90 per cent better able to work. Frequently, the patient states that the tightness in the chest is relieved as early as the first week after operation. This improvement is accepted by us because it can be demonstrated that improvement in circulation can be achieved in a few days. In the majority of patients the degree of improvement is such that only by direct contact with the patient can this be appreciated.

Mortality

In the last 171 consecutive patients operated upon, there was one death during operation, a case in which the heart fibrillated. Another heart fibrillated several hours after operation. The chest was opened; the heart was pumped by hand; the patient was conscious without a heart beat for about ten hours, after which pumping the heart was discontinued. The arterial disease in each heart was severe and extensive, and the inflow was inadequate to support the heart beat. Another death occurred from another arterial occlusion before the patient was discharged from the hospital.

In this series there were 100 consecutive operations with zero operative mortality. In this series the common left coronary artery was soft, pulsated, and felt to be approximately normal in 76 per cent of the cases. If this artery is soft and normal, the assumption is made that the inflow of blood is adequate and the problem in physiology and therapy is that of redistribution in the peripheral areas of myocardium, and operation can accomplish a balanced distribution. This record in surgical therapy speaks for itself.

Conclusion

1. The most effective treatment of angina pectoris is accomplished by surgical operation.

2. Operation redistributes the available blood in the vascular tree so that it can accomplish its greatest amount of good.

3. In the experimental laboratory, operation saves life after a coronary artery is ligated. It also saves muscle destruction. These facts were established by controlled experimentation. No doubt the same protection is given to the human heart.

4. The operative mortality in 100 consecutive patients was zero.

FAR EAST FLU VIRUS VACCINATION POLICY ISSUED

The Department of Defense has issued policy guidance for military to be vaccinated as soon as possible with a special single-strain vaccine to combat a previously unidentified virus which has caused an outbreak of influenza in the Far East.

Dr. Frank B. Berry, Assistant Secretary of Defense (Health and Medical), in a Department of Defense Instruction, said that the vaccine also will be made available to civilian employees and military dependents on a voluntary basis at overseas stations.

The Department said it was supporting the use of the new vaccine in view of the threat to the national security through the loss of manpower and personnel which could occur as a result of an epidemic involving the Armed Forces. Within the Armed Forces, as of this date, no deaths resulting from the new virus have been reported.

An influenza outbreak in Hong Kong, reported in the press on April 18, first alerted Army Medical Service personnel to the new danger. The same day, Walter Reed Army Institute of Research, and Major General Silas D. Hays, Army Surgeon General, took action. A cable was dispatched to the Chief Surgeon of Army Forces in the Far East, Brigadier General

Joseph H. McNinch, suggesting that an epidemiologist be sent to Hong Kong to investigate, and a medical officer was sent at once.

Twenty-five days after the first report of the disease, the virus was in the Institute, and nine days later the laboratory had identified the virus as one different from any known influenza strain. The Armed Forces Epidemiological Board have been actively concerned with the problem.

Anticipating a continuing threat from the new Far East influenza virus, Dr. Maurice R. Hilleman, Chief of the Department of Respiratory Diseases at the Institute of Research, requested on May 29, through the Surgeon General's Office, an emergency purchase of diagnostic laboratory materials. Without these materials, laboratory diagnosis of the new strain is impossible. Because the new Far East strain was so different from the older viruses, no materials existed which would permit its diagnosis.

With this emergency purchase made, the difficulty was overcome. These materials will now be distributed to service laboratories as required.

The Departments of the Navy and Air Force also have initiated studies on the infectivity of this disease.

Medical Aspects of the Surgical Treatment of Coronary Heart Disease

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THERE can be little doubt that the ultimate solution to the problem of coronary heart disease lies in prevention of the occlusive degenerative process in the coronary arteries. However, until this becomes a practical reality, the patient who is a victim of the clinical manifestations of coronary heart disease should be given the benefit of such procedures which effectively and safely produce clinical improvement and reduce the exorbitant mortality associated with this disease.

In a fundamental sense, angina pectoris, myocardial infarction, and the fatal heart attack merely represent varying responses of the heart to the occlusive process in the coronary arteries. However, there is no obligate relationship between the degree of reduction in coronary inflow and the consequences thereof.¹ The essential role of inter-coronary arterial channels in preventing the catastrophic consequences of coronary artery disease is evidence of the protection afforded by a more equal distribution of the available coronary inflow.² If this collateral circulation is adequate, complete coronary artery occlusion may occur without significant muscle damage. The fate of the myocardium and indeed the fate of the patient depends upon the amount of blood available beyond the stenosis or occlusion of the coronary artery. The natural development of inter-coronary communications is an uncertain process and is unfortunately most frequently inadequate.

The Beck I operation has evolved as a safe and effective procedure to be applied to patients with coronary artery disease. The achievement of a low operative mortality and the demonstration of clinical benefit justify application of the operation to a large group of selected patients with clinical evidence of coronary artery disease. The surgical details have been reported elsewhere.³ Briefly, the

operation consists of: abrasion of the parietal pericardium and epicardium, partial ligation of the coronary sinus, instillation of asbestos, and grafting of parietal pericardium and mediastinal fat to the heart. This is done as a one-stage procedure. This report is based upon a series of 225 consecutive patients operated upon for coronary heart disease, in Cleveland, during the six-year period from January, 1951, to January, 1957. The medical evaluation and selection of patients was carried out by the medical cardiologist; the operation was performed by Dr. Claude Beck.

Indication for Operation

Operation is indicated in patients who have clinical evidence that coronary arterial disease has compromised the myocardial blood supply. The achievement of a low operative mortality now justifies the application of the operation to patients with very "early" disease, before extensive myocardial damage has occurred. By the same token, the protection afforded by operation need not be withheld until the patient has had at least one myocardial infarction; early operation can reduce the 10-20 per cent mortality associated with the first episode of myocardial infarction. Operation may also be performed even after several episodes of infarction; but, obviously, little benefit can be achieved if the heart is damaged to the point of dilatation.

In the classification of patients with clinical evidence of coronary artery disease, consideration must be given not only to the degree of myocardial degeneration, but also to the progression of the occlusive process in the arteries. The following preoperative classification has been found useful:

Group 1. Patients with mild symptoms. Usually under fifty years of age. May have small infarct and/or mild angina.

Group 2. Moderately advanced disease. Moderate to severe angina. May have one or more infarcts. Normal heart size.

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- Group 3. (a) Salvage cases. Extensive muscle damage. May have large heart and congestive heart failure;
 (b) Status anginosus; or
 (c) Certain contraindications.

Contraindications to Operation

Acute myocardial infarction, or even suspicion of impending infarction, precludes operation for at least four to six months. In addition to the obvious dangers of operation during the acute stage, the delay allows for development of natural compensatory mechanisms. Operation is particularly hazardous in younger patients with rapidly progressive symptoms, particularly in those without previous myocardial infarction. These patients are prone to the development of areas of ischemia during or immediately after operation. These hearts tend to develop electrical instability⁴ with resultant ventricular fibrillation, so that an impending medical death may become a surgical mortality.

Cardiac enlargement and evidence of congestive heart failure constitute a relative contraindication to operation. However, in 20 per cent of the patients operated in this series, the left ventricle was fluoroscopically enlarged. At least one-fourth of these patients had objective evidence of early congestive failure. Although it is too late for much benefit in such patients, the heart is remarkably stable and they tolerate operation quite well.

Although a moderate degree of blood pressure elevation was present in 25 per cent of the patients operated, severe hypertension, or any other associated disease, which, *per se* significantly limits life expectancy, contraindicates operation.

Symptoms and Duration

In the present series, 75 per cent had suffered at least one clinically proved myocardial infarction. Two or more infarctions had occurred in 20 per cent. Angina pectoris, ranging in severity from very mild to complete status angiosus, was present in 95 per cent of the patients operated.

The duration of symptoms, *per se*, of course gives no indication of the severity of the disease. The range in this series was four months to thirteen years, with an average of 2.9 years. In general, patients with symptoms of longer duration appeared to tolerate operation better.

Preoperative Management

The purpose of the preoperative study is to establish the diagnosis and to rule out contraindications to surgery. In patients with coronary artery disease, extensive diagnostic procedures do *not* constitute good medical management and actually may be dangerous.

Such usually superfluous procedures as the electrocardiographic exercise tolerance and anoxemia tests should be performed only when the diagnosis is in doubt. In a patient with a critically compensated coronary circulation, undue stress may produce catastrophic consequences. Obviously, in a patient with electrocardiographic evidence of old infarction, such tests are contraindicated. Furthermore, in a patient with typical symptoms, a negative test in no way alters the diagnosis.

The preoperative hospital stay should be as short as possible. Exhausting tests are particularly contraindicated on the day before operation. Anxiety and apprehension on the part of the patient appear to have a specific deleterious effect; such patients have a greater operative risk, presumably associated with the lowered fibrillation threshold of the heart.⁴ Operation should not be performed unless undue apprehension is allayed.

Operative Mortality

Of the 225 patients operated since January, 1951, there have been eleven deaths associated with surgery (two during operation, nine in the early postoperative period), for a total mortality of less than 5 per cent. Careful selection of patients and improvements in medical and surgical management have resulted in a progressive lowering of operative mortality, as evidenced by a recent series of 100 consecutive patients operated in which the only mortality occurred in a salvage case just prior to his discharge from the hospital. At least thirty of these 100 were salvage cases. However, in every instance, symptoms had become fairly stable for a few months prior to operation. Recognition of the limitations of operation has prompted judicious delay in seriously ill patients. Certainly, if a catastrophe is imminent, an ill-timed operation will only hasten it. A delay of a few months permits time for stabilization and greatly enhances toleration of operation and the achievement of a good result.

Course of Patients After Operation

The immediate postoperative course is usually remarkably uneventful, even in those patients who appeared severely ill before operation. Rarely, does the patient complain of pericarditis pain (even though the postoperative electrocardiogram most frequently shows such a configuration). Small left pleural effusion occurs often, but only rarely requires thoracentesis. Evidence of pericardial effusion is rare. In no case has long-term follow-up revealed evidence of deleterious effect of the operation itself. Compression of the heart by a pericardial scar has not occurred.

In approximately 25 per cent of the patients there is almost immediate improvement in symptoms, so that a few days following operation they volunteer the observation that a given amount of exertion no longer causes pain. Generally, following discharge ten to fourteen days after operation, patients are encouraged to return to at least part-time work in four to eight weeks.

In the great majority of patients there is progressive improvement over a course of one to six months after operation. Occasionally, a patient may show no improvement for a few months followed by a period of rapid and dramatic subsidence of symptoms.

Long-term follow-up of the first 100 patients alive at this time reveals a very significant observation. At least fifteen of them have had one or more severe "attacks" requiring hospitalization. However, in only three instances was there definite evidence of transmural myocardial infarction. In each case the patient recovered and eventually returned to work with no worsening of his symptoms. The other twelve patients have had one or more bouts of severe precordial pain (one patient has had five) associated with transient T wave changes in the electrocardiogram. Usually, the pain subsided rapidly and they returned to work in one to four weeks.

In only ten per cent of the patients did long-term follow-up reveal no improvement. However, in some of these there were such complications as severe narcotic addiction, psychoses, and cerebrovascular accident.

Remarkably enough, three of the patients who had evidence of early congestive heart failure prior to operation appeared to be much better compensated after operation. One of these, who had previously required weekly mercurial injections, has now gone eight months without injection.

Unfortunately, the very nature of coronary artery disease is such that so-called *objective* methods for evaluation of medical or surgical treatment are of little value. Reliance on the electrocardiogram or ballistocardiogram is unrealistic. Generally speaking, each patient serves as his own control.

Unusual Manifestations of Coronary Heart Disease Relieved After Operation

Of particular interest is a group of patients having, in addition to the common symptom of coronary heart disease, certain unusual manifestations.

1. Ventricular premature beats. In approximately 5 per cent of the patients operated, ventricular premature beats played a prominent role in the patient's symptomatology. Following operation, this annoying arrhythmia is no longer present or is at least less frequent in most of the patients previously demonstrating it.

2. Reduction or absence of arterial pulses particularly in the left arm. A significant number of patients gave a history of "poor circulation" associated with the clinical onset of coronary heart disease. This was usually manifested by coldness of the extremities. One patient in particular, complained of coldness of the left arm and hand. There were no palpable arterial pulses in the left arm and no blood pressure reading could be obtained in that arm for two years prior to operation. On the day following surgery, good pulsations and a normal blood pressure reading were obtainable from the left, and have continued for the year subsequent to surgery.

3. Sensory changes in the hands. This was particularly well demonstrated in a forty-two-year-old man with severe, progressive angina for three years. For two years before operation this patient noticed a diminution of sensation in both hands, more marked in the left. The sensory disorder was such that he dropped objects from his hands, especially sheets of paper which he could not feel. Examination of the hands and arms showed diminution of light touch, pin point pain and temperature. Following operation on the heart these sensory changes completely disappeared. Again, this is suggestive evidence of causal relationship between myocardial ischemia, sensory changes in hands and arms, reduction of ischemia by operation and return of normal sensation.

4. Shoulder-hand syndrome. This distressing syndrome was particularly annoying in a fifty-five-

year-old male patient following a massive anterior myocardial infarction. In the interval after the infarct, he developed fixation of his shoulders and arms so that they could not be elevated. The patient did not have sufficient mobility to dress himself and he was scarcely able to feed himself. The muscles of the shoulder girdle had become atrophic. Physiotherapy failed to produce improvement. Motion was painful. Following surgery for coronary heart disease, physiotherapy was again given. Marked improvement followed. Within a few weeks he could elevate his arms and motion was not painful. Eventually, he had complete return of function.

Longevity

Long-term follow-up has been carried out on the 137 consecutive patients discharged over a period of six months to five years ago (average: two years since operation). The expected mortality in such a group over this period would be 30 per cent or forty-one dead.⁵ Actually eighteen are known or assumed to be dead, a mortality of 13.1 per cent. Thus, even at this relatively early period, life expectancy can be shown to be increased by operation. Since operation does not prevent the occlusive process in the coronary arteries, a period of symptomatic improvement may be terminated by overwhelming occlusion and death. Such was the case in 50 per cent of the patients who died six months to five years after operation.

Present Status of Operated Patients

Of the 100 consecutive patients who were alive and could be evaluated over a six-month to five-year follow-up period, forty-five are completely free of heart pain. Another forty-five claim that they have considerably less pain than before operation. Thus, 90 per cent have symptomatically excellent results.

By the same token, forty-two are able to work with no limitations, while forty-eight are better

able to work with some limitations. Thus 90 per cent are economically productive. (Prior to operation only 45 per cent had been able to work half-time or more.)

Summary and Conclusions

The Beck operation for coronary artery disease is a safe and effective method for providing a more adequate distribution of arterial blood supply to the heart. Operation is indicated in patients with clinical evidence of coronary heart disease unless there is a specific contraindication. The operation should not be considered as merely a salvage procedure. Best results are obtained by operating early in the course of the disease.

In a consecutive series of 100 patients operated, only one died prior to discharge. The over-all mortality for 225 patients operated since January, 1951, is less than 5 per cent. Long-term follow-up reveals a significant increase in longevity for operated patients. Furthermore, 90 per cent were back at full-time or part-time work with little or no limitations.

In view of the proved effectiveness of the Beck operation for coronary disease, the demonstration of a very low operative mortality removes the operation from the category of salvage procedures and justifies its early application to a majority of patients with coronary disease.

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NEW ABSTRACT PERIODICAL ISSUED

The first issue of an abstract periodical, *Cardiovascular Diseases*, was announced in June by the Public Health Service and the Excerpta Medica Foundation. The new journal, which will be published by the Foundation, will provide a means through which scientists interested in heart research can keep abreast of the literature, now a difficult task because of the increasing number of scientific publications in this field.

A grant of \$28,750 for the first year was made to the Foundation by the National Heart Institute of the

Public Health Service on recommendation of the National Advisory Heart Council.

Leading cardiologists and scientists serve on the Advisory Board of the publication and recommend type of coverage and the journals to be abstracted. The Board, appointed by the Excerpta Medica Foundation, will have approximately forty members, nine from the United States. About 7,000 abstracters throughout the world will contribute capsule versions of heart literature from approximately 1,800 selected journals.

Brain Tumors

Practical Approach and Classification

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IT IS always difficult to present hard and fast rules in differentiating between benign and malignant lesions in any portion of the body. To present this subject fairly as regards lesions of the brain, let us consider them in relation to malignant lesions elsewhere in the body.

A fairly accurate assay of five-year survivals, which has become an accepted rule of thumb, covering malignant lesions in other portions of the body than the brain, has been given to us by Dr. Dockerty of the Section of Surgical Pathology of the Mayo Clinic, and is presented in Table I.

We have attempted to evaluate malignant lesions of the brain in the same manner, and have graded them according to cellular differentiation. This was first attempted in 1933 during a symposium, "Cancer Is Curable," at the meeting of the American College of Surgeons.¹ More recently, Kernohan, Mabon, Svien and Adson have followed through with a more detailed evaluation of the subject and have applied the grading both in fixed sections and fresh frozen sections. Kernohan and Dockerty at the present time are examining all tumors either biopsied or removed in the neurosurgical operating rooms, and we neurosurgeons find it helpful in designing our operations and giving a more concrete prognosis.

During the recent war, we found that pathologists who were acquainted with this system of grading tumors and who were not well versed in neuropathology gave us an adequate pathologic evaluation of brain tumor. Regardless of the neuropathologic nomenclature, the observation and grading of gliomas of the brain were helpful in giving a diagnosis and especially a prognosis.

Neurosurgeons are faced with the problem of quick diagnosis in many hospitals which have no

neuropathologist, but have qualified general and surgical pathologists, and we think the grading of gliomas is a practical solution to the problem.

TABLE I. FIVE-YEAR SURVIVAL RATES OF PATIENTS WITH TREATED MALIGNANT TUMORS

Location or Type of Tumor	5-Year Survival, Per Cent
Breast	45
Uterine cervix	48
Uterine fundus	75
Stomach	25
Gallbladder	10
Pancreas	10
Colon (left)	35
Colon (right)	50
Lungs	15
Ovaries	30
Testes	35
"Melanomas"	20
Bone (osteogenic sarcoma)	18

It is with the idea of simplifying the pathologic diagnosis and supplying the neurosurgeon with early information regarding the nature and degree of malignancy that we are presenting this concept.

TABLE II. FREQUENCY OF THE VARIOUS TYPES OF INTRACRANIAL TUMORS

Type	Per Cent	Type	Per Cent
Glioma	41	Craniopharyngioma	4
Pituitary adenoma	15	Chordoma (dermoid and epidermoid)	2
Meningioma	20	Metastatic tumor	4
Acoustic neurinoma	11	Granuloma (tuberculous, etc.)	1
		Hemangio-endothelioma	2

The frequency of the various types of intracranial tumors is given in Table II. Pathologically, brain tumors can be conveniently subdivided as follows: (1) tumors of the envelopes of the brain (meningiomas, sarcomas, and so forth); (2) tumors of special structures (pituitary adenomas, pinealomas); (3) tumors arising from heterotopic rests (epidermoids, dermoids, craniopharyngiomas, chordomas); (4) tumors arising from cranial nerves (neurofibromas); (5) tumors

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The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.

arising from vascular tissue (hemangio-endotheliomas); (6) tumors arising from neural elements (gliomas), and (7) metastatic malignant lesions.

Any question of benign and malignant tumors of the brain immediately brings up ideas of primary or metastatic tumors (4 per cent), in view of the fact that malignant lesions of the brain may be metastatic from malignant lesions elsewhere in the body. It seemed to us that we could best approach the problem by outlining the benign lesions which occur in the brain.

Epidermoid tumors result from congenital rests. They are characterized by large cysts containing flaky, desquamated epithelium and have the appearance of mother-of-pearl. The capsule of the tumor is composed of epidermis.

Dermoid tumors are similar to epidermoid tumors, except that in addition to the epidermis they also contain sweat glands, sebaceous glands or hairs, or hair follicles. The contents also usually resemble those of epidermoid tumors.

Teratomas are similar to dermoid tumors, except that in addition they have some structures containing mesoderm, such as bone and cartilage. (Actually, dermoids are "simple" teratomas.)

Neurofibromas, neurilemmomas or perineural fibroblastomas arise from cranial and spinal nerves, frequently from the eighth cranial nerve. They are encapsulated and circumscribed and usually grow slowly. They are characterized by regions of degeneration or small cysts, blood pigment, cells containing fat (so-called foam cells), interlacing fibrils and palisading of the nuclei. Usually all these characteristics are present, but sometimes only one or two are seen. Occasionally these tumors simulate meningiomas, on the one hand, or astrocytomas, on the other. They are nearly all benign.

Meningiomas are nodular, rounded, circumscribed and encapsulated tumors, usually vascular and usually slowly growing, although a small number of them are malignant. Frequently they contain concentrically calcified masses called "psammoma bodies," which are so numerous that the tumors are called "psammomas." The cells tend to grow in whorls. Sometimes these neoplasms are very cellular and invade the bone, but mitotic figures are rarely present. When they are present in more than occasional numbers (10 per cent), we classify the meningioma as being malignant and anticipate recurrence.

Meningiomas represent the large operable group

of cerebral tumors. They usually arise from arachnoid villi and most often are situated along the large sinuses of the cranial cavity. They are distinctly encapsulated and, as a rule, do not invade the brain but displace it. Their growth is slow and often requires many years for the production of symptoms. They sometimes produce proliferation of bone in the immediate vicinity, and tumor cells frequently are found to invade the hypertrophied region, a characteristic which offers material assistance in localization of the neoplasms by roentgenologic examination. Meningiomas usually can be removed completely unless they are situated in an inaccessible place; with the aid of the electrosurgical knife many more of these tumors are removed now than formerly. It is essential that the overlying meninges, as well as the invaded bone, be removed to avoid recurrence. Occasionally, malignant changes develop, and the tumor recurs.

Although hemangio-endotheliomas occur most frequently in the cerebellum, they have been found in all parts of the nervous system. A tumor of this sort sometimes occurs as a small tumor nodule (so-called mural nodule) on the wall of a large, smooth-walled cyst. They usually are composed of numerous dilated capillaries with large endothelial cells lining the lumina and large phagocytic cells laden with numerous droplets of fat. These tumors occasionally are associated with hemangiomas of the eye, or of the skin, and with a cystic pancreas or liver or adenomas of the kidneys; in such cases they constitute what is sometimes called "Lindau's disease." Hemangiomas are benign. Hemangio-endotheliomas shade over into hemangiosarcomas and are generally regarded as being of a rather low order of malignancy.

Chordomas arise from notochordal remnants in the base of the skull, the so-called clivus blumenbachii, or from the intervertebral disks. They must be distinguished from chondromas. They are characterized by islands in which there are cords of epithelial-like cells growing in myxomatous matrix. The cells and their nuclei usually are vacuolated and have a foamy appearance (physaliferous cells). In the cytoplasm the vacuoles contain mucus and glycogen, and also a proglycogen which does not dissolve in water. Chordomas rarely metastasize, but they are very prone to recur.

Pituitary tumors include neoplasms which arise

from the three primary structures of the pituitary gland. The chromophobe adenoma usually is responsible for the hypopituitary syndrome, whereas the chromophil adenoma is found in cases of hyperpituitarism. Tumors of the cranio-pharyngeal duct arise from Rathke's pouch. All these and other variations of pituitary tumors are capable of enlarging the sella turcica and of producing suprasellar extension. They usually produce some form of hemianopsia, of which bitemporal hemianopsia is the commonest, but it is obvious that the position and extent of the tumor will cause these manifestations to vary from time to time. They rarely produce papilledema, but frequently give rise to optic atrophy preceded by pallor of either side of the margin of the disk. Choked disks develop only when the tumor extends upward and posteriorly into the third ventricle, resulting in block of one foramen or both foramina of Monro. The commonest tumors which produce such symptoms are tumors of the craniopharyngeal pouch. Although enlargement of the sella turcica is considered to be pathognomonic of pituitary tumor, it cannot be relied on as an absolute sign, since the posterior clinoid processes, and even the sella turcica, may be eroded in the presence of increased intracranial pressure caused by cerebral tumors in other locations. Therefore, the diagnosis of tumor of the pituitary body usually is based on clinical hypopituitarism or hyperpituitarism plus enlargement or erosion of the sella turcica, perimetric field defects, changes in the ocular fundi or more than one of these features. Most of these tumors can be removed by the intracapsular method.

Dermoids and similar tumors represent a group of encapsulated tumors which often can be removed, depending on their size and exact position. Most of these present roentgenologic shadows which serve to supplement neurologic data in localization of the tumor. Pinealomas are an exception, chiefly owing to their location.

A surgeon dealing with malignant lesions desires to determine two facts from the microscopic examination of the tissue with which he is confronted: First, what is the kind of tumor? Second, what is its relative malignancy? The surgical procedure is often determined or modified by this knowledge. In Broders' method of grading carcinoma, the general surgeons have been provided with such a measure of the degree of malignancy.

The neurosurgeon, however, has not had this advantage, inasmuch as no system of grading has been applied to brain tumors. Neuropathologists have differentiated benign and malignant meningiomas and adenomas of the pituitary. However, with the present classification of the glioma group, which constitutes 41 per cent of the brain tumors, the neurosurgeon is confronted with many subdivisions, and obtains only a relative index of their malignancy. It was believed that a simplification of the present classification of the gliomas together with the grading of the degree of malignancy within each group would be highly advantageous to the neurosurgeon. Our glioma group was re-studied with this thought in mind. The concept has been applied, which is rather universally held by general pathologists in dealing with carcinoma elsewhere in the body; namely, that malignant change represents an anaplastic transformation of adult cells. The neural tissue of the brain is made up of four different types of cells, and consequently when the concept of anaplastic change is applied to the study of gliomas there are five types arising from these cells: namely, (1) astrocytoma, (2) ependymoma, (3) oligodendroglioma, (4) medulloblastoma, and finally (5) a debatable neoplasm—neuro-astrocytoma.

When considered histologically from the anaplastic concept, the astroblastoma and glioblastoma multiforme are merely more malignant forms of astrocytoma. Likewise, the ependymblastoma has been shown to be merely a more malignant form of ependymoma. It was determined histologically that malignancy within each of these five groups could be conveniently graded from 1 to 4. Correlation studies between grade of tumor and postoperative survival period substantiate these conclusions.

The derivation of the medulloblastoma has not been definitely established, and it is believed to be in a class by itself. This glioma has a relatively constant histologic structure, and practically all examples have the attributes of a grade 4 neoplasm. The poor results of treatment bear this out.

The suggested modification of the classification of gliomas is presented in Table III.

Data on astrocytomas are given in Table IV.

Astrocytomas, grade 1, are slowly growing neoplasms; they are firm and usually nonencapsulated tumors. They are composed of fairly normal astrocytes with numerous well-formed glial

TABLE III. POSTOPERATIVE SURVIVAL

	Grade	5-Year Survivals, Per Cent	Average Survival, Months	Longest Survival, Years
Astrocytoma	1-2	47.5	76 +	13 +
Medulloblastoma	4	12.6	15	7 +
Oligodendroglioma	1-4	4.0	66 +	15 +
Ependymoma	1-4	3.7	25 +	14 +
Pinealoma	1-4	2.0	18 +	—

TABLE V. EPENDYMOMA ACCORDING TO GRADE
OF MALIGNANCY: 57 CASES

Grade	Cases	Average		
		Age, Years	Duration of Symptoms, Months	Postoperative Survival, Months*
1	30	26.1	19.8	77.0
2	8	28.5	19.6	37.7
3	9	21.0	9.0	18.2
4	10	31.3	9.1	10.1

*Since some of these patients were living at the time of this study, these figures represent minimal estimates of the average postoperative survival.

fibrils, which often form vascular feet. The group includes the polar spongioblastomas of the older terminology. These are confusingly similar to neurofibromas.

Astrocytomas, grade 2, also are slowly growing neoplasms, but are somewhat more pleomorphic than the grade 1 tumors. The cells are slightly larger, glial fibrils are fewer and shorter, and the vascular processes are short and heavy.

Astrocytomas, grades 3 and 4, formerly designated "glioblastoma multiforme," are among the most malignant of all gliomas and comprise 57 per cent of the group. They have multiform characteristics, both grossly and microscopically. Histologically, the tumors usually are characterized by giant cells, by mitotic figures and by variation in the size of the various cells and their nuclei. Frequently there are vessels with marked proliferation of the lining endothelial cells, sometimes progressing to complete or almost complete occlusion of the lumen of the vessels; hence, regions of necrosis or cysts are found.

Data on ependymomas are given in Table V.

Ependymomas, grades 1 and 2, are very slowly growing tumors, arising as a rule from the ependyma of one of the ventricles of the brain or from the central canal of the spinal cord. Sometimes they are circumscribed and appear to have capsules so that they can be enucleated. The histologic picture frequently features papillary architecture, and the tumor cells also tend to form canals similar to the central canal of the spinal cord.

TABLE IV. ASTROCYTOMA ACCORDING TO GRADE
OF MALIGNANCY: 161 CASES

Grade	Cases	Average		
		Age, Years	Duration of Symptoms, Months	Postoperative Survival, Months*
1	32	33.9	20.8	73.6
2	38	38.2	11.2	23.8
3	37	40.4	11.8	11.5
4	54	42.6	7.3	6.6

*Since some of these patients were living at the time of the study, these figures represent minimal estimates of the average postoperative survival.

Ependymomas, grades 3 and 4, present a histologic picture in which the characteristic ependymoma structure is less and less clearly defined as the grade of malignancy increases. Variations in size and shape of cells and their nuclei and mitotic figures are present. These tumors parallel astrocytomas, grades 3 and 4, in rapidity of growth.

Oligodendrogliomas, grades 1 and 2, have a tendency to degenerate and to become cystic, and often contain deposits of calcium, which can be seen on roentgenologic examination. These tumors are characterized histologically by their unusual honeycombed appearance of small clear-looking cells. It is very difficult to demonstrate stainable cytoplasm or processes in these cells. The nuclei are very small and look like lymphocytes lying in holes.

Oligodendrogliomas, grades 3 and 4, may be among the most malignant neoplasms of the nervous system. They simulate oligodendrogliomas, grades 1 and 2, except that the cells of these tumors are larger than those of oligodendrogliomas, grades 1 and 2, and contain mitotic figures. Some cellular cytoplasm can be seen and the nuclei are large.

Ganglioneuromas, gangliocytomas, gangliogliomas or neurocytomas (neuro-astrocytomas, grade 1) are rare. They are characterized by a basic "astrocytoma" appearance plus the presence of well-formed ganglion cells which contain Nissl bodies. Silver nitrate may be employed to demonstrate the processes of these ganglion cells.

Medulloblastomas usually are found in children in the midline of the cerebellum. They are very malignant neoplasms (grade 4), and they tend to implant themselves in the ventricles or meninges. In spite of the high degree of malignancy of these tumors, mitotic figures may occasionally be hard to find. Microscopically, the tumor cells have oat-shaped nuclei and a small amount of cyto-

plasm which tends to taper at one end. The cells grow in small clusters and may produce rosettes.

In all reported series of brain tumors, the incidence of medullo-epithelioma has been exceedingly low and in many series no tumor of this type has been found. At the Mayo Clinic, those tumors that had been classified as medullo-epithelioma were critically restudied and it was found that they were either ependymomas, grade 4, or medulloblastomas; therefore, we have eliminated this tumor entity from the classification of gliomas.

Sarcomas are much rarer than at one time they were supposed to be. Usually, they are highly malignant tumors probably arising from the connective tissue around the blood vessels. There is a sharp line of demarcation from the surrounding portion of brain, which is softened and degenerated around the tumors so that they seem to be encapsulated. The lesions occur most commonly among young adult persons.

Metastasis of carcinomas to the central nervous system is fairly common. The primary lesion is usually found, however, before any neurosurgical intervention is undertaken, and this fact may be considered adequate reason for not attempting such measures. Frequently there are metastatic growths elsewhere. When the tumor in the brain is the only demonstrable metastatic lesion and the primary carcinoma is small and slowly growing, enucleation of the cerebral lesion is justified, since it sometimes relieves intracranial pressure for a prolonged period.

Metastasis to the central nervous system may take place from almost any organ of the body, but the lungs are the most frequent primary seat of such a neoplasm. In the Mayo Clinic it has become a routine procedure to obtain roentgenograms of the thorax in all cases in which a neoplasm of the central nervous system is suspected. This procedure has disclosed most carcinomas of the lungs, and in doubtful cases bronchoscopic examination has usually settled the question. In spite of these precautions, some patients are operated on for metastatic tumors of the brain in the belief that the lesions are primary. The primary tumor may be hidden by the shadow of the clavicle, the heart, or the hilus of the lung. Often pulmonary symptoms are not present. In one case, tuberculosis was considered and subsequently healed tuberculosis was found with a carcinomatous lesion growing nearby.

It is important to distinguish metastatic carcinomatous lesions of the central nervous system from primary neoplasms of the brain. Sometimes such distinction is made with difficulty, particularly when very small portions of tumor have been removed at operation. It is especially difficult at times to differentiate the so-called oat-cell variety from medulloblastoma unless the age of the patient and the situation of the growth are taken into consideration. If, however, attention is given also to location, the number of mitotic figures, the size of the nuclei, and the amount and arrangement of the cytoplasm, a correct diagnosis can be made.

The surgical treatment of brain tumors has made rapid progress in recent years, with the improvement in cerebral localization and surgical technique. The introduction of antiseptic substances, asepsis and methods of hemostasis has reduced surgical hazards and has lowered the surgical mortality rate. The development of surgical technique with the aid of the electrosurgical knife and the electrocoagulation needle has made it possible to remove tumors which previously would have been inaccessible. By these means also it has become possible to effect subtotal resection of extensive gliomas and even lobectomy when it is advisable. Cerebral localization of new growths has made much progress with increasing knowledge of the functions of the brain. Pneumoencephalography and pneumoventriculography have contributed to the localization of brain tumors. Neuropathologists have given to the medical profession a better understanding of the life cycle of the various types of tumors than they had formerly. They have supplied information to the neurosurgeon in order that he might exercise improved judgment in the surgical treatment of brain tumors. Since tumors originate from all the structures within the brain, and from the blood vessels, the meninges and the nerves, it is apparent that the size of the tumor, its situation, the degree of its encapsulation and invasion of adjacent structures, its vascularity and its degree of malignancy will vary.

Comment

In approaching an analysis and evaluation of malignant lesions of the brain, we feel very strongly that a correlation can be made with malignant lesions elsewhere in the body. In view of the fact that gliomas are primary malignant tu-

mors arising within the brain substance and constitute 41 per cent of all intracranial tumors, it might be well to discuss them first. In the early days of neurologic surgery, all gliomas were looked on as having the same origin and the same degree of malignancy. It was not until Bailey and Cushing³ presented their classification that the origin, course and malignancy of the tumors were better understood. Previous to this time, there had been sporadic and individual attempts to classify these tumors with regard to their rate of growth, their malignancy and the postoperative longevity of the patient. The neuropathologists have accepted Bailey and Cushing's classification, and a great deal of valuable information has resulted from follow-up studies on these cases.

However, during the war it was brought to our attention that those of us who had been operating with associates in neuropathology needed some clarification of malignancy of brain tumors. In approaching this problem to orient general pathologists with regard to relative malignancy of the tumors and help them fulfill their responsibilities with regard to the surgeon's approach, we asked Dr. Dockerty to give us a five-year survival rate on cancer of the breast, uterine cervix, uterine fundus, stomach, gall bladder, pancreas, colon (left), colon (right), lungs, ovaries, testes and bone, and on "melanomas." These tumors located elsewhere in the body have been followed and graded. For some time we have been attempting to grade our primary tumors of the brain, and for this reason we have divided them into five classifications: astrocytoma, ependymoma, oligodendroglioma, neuro-astrocytoma and medulloblastoma. In only four of these have we been able to grade the tumors with regard to their malignancy on the basis of cellular differentiation and to correlate the preoperative symptoms as well as postoperative longevity. In the astrocytoma group, 161 patients have been followed. In this group there were thirty-two cases in grade 1, thirty-eight cases in grade 2, thirty-seven cases in grade 3, and fifty-four cases in grade 4. The interesting thing about this survey is that the average age of patients with grades 1 and 2 was between thirty and thirty-nine years and that of patients with grades 3 and 4 was between forty and forty-nine years. The duration of symptoms was longer in grades 1 and 2 than in 3 and 4, and the postoperative survival corresponded.

Fifty-seven cases of ependymoma were fol-

lowed: thirty cases in grade 1, eight cases in grade 2, nine cases in grade 3, and ten cases in grade 4. The age differentiation was not as marked as in the previous series, but there was a very interesting correlation between the preoperative duration of symptoms and postoperative survival. One interesting observation with regard to this group is the fact that more than 50 per cent were in grades 1 and 2 and had a much better prognosis than in grade 4.

The frequency of the various types of intracranial tumors also brings out some of the relative percentages which influence our thinking with regard to mortality and longevity in cases of tumor of the brain. While 41 per cent of the intracranial tumors are gliomas and 4 per cent are metastatic tumors, 15 per cent are pituitary adenomas, 20 per cent are meningiomas, 11 per cent are acoustic neurinomas, 4 per cent are cranio-pharyngiomas, 2 per cent are chordomas and dermoids, 1 per cent are granulomas and 2 per cent are hemangio-endotheliomas.

Thus, when a diagnosis of glioma of the brain is made it does not necessarily mean that the patient's death warrant has been signed any more than when a diagnosis of cancer of the breast or cancer of the lung is made. Since the gliomas have been studied microscopically and graded in the same manner as cancer elsewhere in the body, the surgeon at the operating table has been able to tell whether or not to approach the tumor radically, removing a section of the brain containing the tumor, or in a palliative manner in which the tumor is removed *in situ*.

This approach to grading of gliomas has been accepted by pathologists and neurosurgeons in a surprising number of medical centers. When one thinks of brain tumors, one must differentiate between the benign and the malignant, and secondarily one must consider malignant lesions of the brain in the same manner that one considers malignant lesions elsewhere in the body and treat them in a like manner.

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Resuscitation of the Newborn

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INASMUCH as I devote approximately half my time to the practice of anesthesiology and half to general practice, I have the recurring opportunity, as you do, to experience some of the problems in general practice in which knowledge and experience in the field of anesthesiology aids in obtaining a quicker or better solution to the problem at hand. With this dual concept in mind, that is as a general practitioner and as an anesthesiologist, I am going to present a commonly occurring problem—that of the newborn infant requiring resuscitation.

Let us be academic for a moment and begin by formulating a definition of what we mean by the infant needing resuscitation. Any newborn infant who does not initiate upon birth and maintain thereafter a normal respiratory rate rhythm and minute volume, and thereby shows cyanosis in any degree, is an infant who requires resuscitation. Resuscitation then becomes the employment of any means necessary to restore the respiratory deficiency to normal. This may range from the simple administration of oxygen to the employment of a number of mechanical contrivances in addition. These devices may be primarily for clearing the airway of any obstruction, or for promoting the passage of oxygen to the site of gaseous exchange, the alveoli, or for both purposes.

Before we consider in more detail the means of treatment, and outline a program of action which should become habitual for all of us, let us review some of the causes of the respiratory difficulty in the newborn infant. All causes can be listed under two headings, the central and the peripheral causes. When respiratory depression or absence is due to central involvement there is a hypofunction or absence of function of the respiratory center in the medulla. This may be drug induced, or may be caused by obstetric difficulties in the mother, with severe and prolonged periods of hypoxia or anoxia in the unborn infant. Such maternal-infant accidents are represented when

we are faced with placenta previa, abruptio placenta, prolapsed cord, and difficult deliveries as a result of maternal pelvic dystocia with resultant cerebral trauma and/or hemorrhage in the baby.

A second group of causes of respiratory difficulty is present when the etiologic factor is a peripheral disturbance. This may be a congenital malformation in either the upper or lower respiratory passages. As examples, we can list cleft lip and palate, laryngeal malformations and growths, tracheo-esophageal fistulae, and obstructive tumors in the upper and lower tracheobronchial tree. Atresia of major structures at any level in the respiratory tract may be the cause of severe difficulty. These conditions are uncommon. However our most commonly encountered problem in this group of peripheral causes is the mechanical obstruction of the upper and lower tracheobronchial tree by amniotic fluid, blood, and debris.

Before taking steps to initiate definitive treatment, one must take a few moments to survey the cause or causes of the respiratory difficulty. Momentary observation of the deficiency respiring infant will give us a good lead as to what major group of causes is to be considered. If we have a limp, flaccid and pale or ashen-cyanotic infant with absent or markedly deficient respirations, central involvement is strongly suggested as the primary cause, though other factors may also be present. If, on the other hand, we are presented with a normotonic or hypertonic, lividly cyanotic child with respirations that are labored and showing sternal and intercostal retraction with respiration, we are probably dealing with any of the causes that produce obstruction high or low in the respiratory tract itself. Being cognizant of the potential difficulties with the infant when a long and difficult labor and delivery has occurred, or when fetal distress has been present from placental or cord accidents, will quickly direct our attention to the proper procedure in attempting to resuscitate that infant.

Now let us turn our discussion to the manner of active resuscitation of the improperly respiring

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infant. As in any treatment program in any abnormal situation in medicine, here also definitive treatment is dependent upon etiology, but a few basic principles must be carried out in all instances. Perhaps the basic axiom in all anesthesiologic problems and all instances of respiratory distress is the administration of adequate oxygen supply. The means and manner of supplying this oxygen will vary with given conditions. A second basic axiom, and not infrequently of first importance, is the establishment of a patent airway, if it be impaired, through which the oxygen supply may be administered.

The use of adjunctive measures and mechanical means will depend upon the conditions existing in the infant. Let us take these steps into consideration in the sequence in which we discussed the causes. Obviously, if the difficulty is due to central depression and interference with the function of the respiratory center as a result of cerebral malformations or birth injuries, such as cerebral hemorrhage, and tentorial tears, our only recourse is to supportive treatment, that is, attention to a patent airway and administration of a relatively high oxygen concentration through it. In this situation the prognosis is very grave, and only if the damage is minimal does the infant have much chance at survival. If, however, the depression of the medullary centers is drug induced, and this usually is from narcotics given in too large or too recent doses to the mother, or is due to severe and prolonged degrees of anoxia as a result of placental accidents, active resuscitative measures and the administration of certain specific counter agents will restore a normal respiratory pattern. We will discuss later the manner of active support of respirations, but for a moment I would like to digress and discuss at this point one of the most important drugs now available to us to counteract drug depression. This agent is N-allyl normorphine hydrochloride which is marked under the trade name "Nalline." It is a morphine analogue or derivative and is subject to all the regulations of the Harrison Narcotic Act. It is packaged in a stable solution form in a one cc. ampule containing 5 milligrams, which is the average adult dose, and more recently in a one cc. ampule containing 0.2 milligrams, which is the newborn infant dosage. Nalline is an antagonist to morphine, dilaudid, codeine, demerol, dolophine, levo-dromoran, and most of

the other synthetic analgesic drugs. It does not antagonize the action of the barbiturate and barbiturate-like drugs. Its mode of action is believed to be as a more powerful competitor than morphine and like agents for the cells of the respiratory center, and in this manner displaces the morphine molecule from its hold on the respiratory cell. Inasmuch as Nalline does not produce the depression that the competing drugs do, its displacing the latter restores the functioning power of the cell. While we are talking on the level of the function of the respiratory cell it might be well to say a few words about and against the use of the so-called analeptic drugs such as caffeine sodium benzoate, metrazol, and coramine. The mode of action of this type of agent is a simple stimulation to overactivity of the respiratory cell. If we have a cell that is already suffering an oxygen deficiency and then stimulate it to a dying gasp, as it were, and exhaust its remaining oxygen supply by that activity, we will end up with a cell that is more depressed and perhaps even permanently damaged. Thus we can explain the fallacy of using analeptic agents as respiratory stimulants.

To return to Nalline, we can list certain other actions of the drug which shows its antagonism to morphine. It is of no value in relieving pain, and when administered to the addict will produce all the signs and symptoms of the withdrawal syndrome. Its duration of action is very short, probably not more than fifteen minutes. The mode of administration may be by the subcutaneous route, intramuscularly, or intravenously by direct injection or in a dilute drip solution. The usual dose is 5 milligrams in the adult or 0.2 milligrams in the newborn infant. When a respiratory depression in the newborn may be anticipated before delivery, Nalline may be given intravenously to the mother in the 5 milligram dose, ten minutes or less before delivery. If the difficulty is not anticipated, the 0.2 milligram dose may be given directly into the umbilical vein after delivery; or if this is not feasible, into the infant's buttock. Repeated doses may be given as indicated. The response in all indicated instances is dramatic, and it has been my personal observation that within a few minutes of administration the great majority of these babies respire deeply, and cry lustily for upwards of an hour, and as a result, attain and maintain an excellent color in a nor-

mal oxygen environment. One must interject a word of caution here relative to the indiscriminate usage of Nalline, for we are told that when it is used in the face of a depression not caused by a narcotic overdosage, a potentiation of the depression will occur. Whether this is more apparent than real, I can't say from experience—for ours has been extremely good with this drug—but I find it hard to believe that we achieve 100 per cent accuracy in our diagnoses. Nevertheless, Nalline is a wonderful addition to our armamentarium; and if you take with you today an awareness of it and its usefulness, one of the salient points of my discussion will have been successfully made. It is a drug that has been available to us for some time, but it has not been exploited to us by detail men and in our daily stacks of promotional mail, and as a result a surprising number of us have been unaware of its existence.

Specific case illustrations in medicine are invaluable in fixing ideas in our minds, and so I should like to mention briefly two instances in which the action of the drug could be demonstrated. In the first case, the drug was not used when it would have been the ideal treatment instead of the means that was used, and would have avoided the resultant embarrassing situation that developed. In the second case, Nalline was employed with a rapid termination of what was becoming an alarming situation. Both these cases were in adults and both were in recently delivered mothers, but the drama of narcotic drug depression and its correction is vividly shown.

Case Reports

In the first case, the patient was a multigravida admitted to the hospital close to the hour of midnight, well advanced in the first stage of labor. She was given 100 milligrams of Demerol in the course of preparations for her delivery. Delivery was accomplished in less than an hour thereafter with minimal inhalation analgesia. At the close, the anesthetist reported a moderately elevated blood pressure to the attending physician, and in his immediate post-partum orders he prescribed morphine grains $1/6$ if the pressure continued to rise, which it did. Therefore, approximately one-half hour after delivery, the patient was given the morphine as ordered, or approximately one hour and fifteen minutes after she had been given 100 milligrams of Demerol. Within the next hour, respiratory depression had progressed to the point where the rate was down to ten per minute and subsequently

dropped to as low as two and three per minute. The house doctor was called to see the patient, but being unaware of the proper diagnosis or its specific treatment, ordered only supportive measures, which were totally inadequate. By the time the attending physician had been reached again, the situation was extremely grave; and he, being unaware of the antidote indicated, told the nurses to call the fire department resuscitation squad. Thus, we had the spectacle of burly firemen in rubber boots coming into our maternity section in the dead of the night to administer artificial respiration to the patient for several hours until the drug could be detoxified by natural processes.

The second case occurred, again about midnight, in a patient who had just successfully undergone an emergency Cesarean section under Pentothal curare anesthesia. In our sections we use a special technique in which minimal amounts of Pentothal are used and relatively massive doses of curare to the point of almost total paralysis of the mother. Our experience with this technique, in which tensilon is used as a curare antagonist at the close of surgery, had covered some 200 consecutive sections at this time, and practically all patients were breathing normally, were awake and responding lucidly before leaving the operating room. In the case under discussion, this was not so. The patient was extremely restless, not really awake, and she became cyanotic if respirations were not assisted with 100 per cent oxygen. She was given two more doses of tensilon at intervals in the belief this was all due to the curare; but when the situation failed to improve, a complete review of all possible causes suggested that her premedication of 75 milligrams of Demerol might be the factor. She was then given 5 milligrams of Nalline intravenously, and within a matter of minutes her respirations became more normal, her color was maintained without assistance, and her restlessness ceased. Before she was returned to bed, she was awake and responding normally. This latter patient apparently was extremely sensitive to narcotics, and, though an unusual occurrence, certainly fixed in my mind the value of consideration of all factors, particularly narcotic intoxication, as a cause of respiratory depression.

Now let us consider the treatment of respiratory deficiency as a result of peripheral causes. In the presence of congenital malformations and obstructive growths, surgical intervention, such as immediate tracheotomy, may be necessary along with the usual supportive measures, but fortunately, these instances are rare. Far from rare, though, are those instances where obstruction of the respiratory passages is due to cellular debris, amniotic fluid, meconium or blood. Here is where we can have our highest percentage of successful resuscitative efforts by properly cleansing the hypopharynx and upper tracheobronchial tree with

some form of suction and thereafter combatting anoxia by administration of oxygen with manual assistance with a gas machine until a normal respiratory pattern is established. I'm sure all of us can easily recognize the cases which require no more than aspiration of the nasopharyngeal secretions by simple suction, such as with a bulb. For treating the severe cases which require more extensive resuscitative maneuvers, let me describe the resuscitation tray which we have available at all times in our delivery rooms and operating rooms when sections are being done. All equipment on this tray is maintained in sterile condition. On it we have an infant-sized laryngoscope, two different small infant-sized endotracheal tubes with connectors, an assortment of small rubber catheters for suction directly, and polyethylene tubes for endotracheal suction through the endotracheal tube, and the appropriate connectors for hooking up to a gas machine for manual assistance of respiration and inflation of the lungs. As our suction source we use an Emerson resuscitator which can be used for suction and then quickly switched to use for manual administration of oxygen. In a theoretical case, the procedure we carry out is as follows: The hypopharynx is exposed with the aid of the laryngoscope and by means of catheter suction, it, and the nasopharynx, is cleansed of all accumulated secretions. The epiglottis is then brought into view and elevated with the tip of the blade. This exposes the vocal cords and the catheter is then directed between them and down the trachea, and further aspiration carried out. When one is satisfied that the fluid and other material has been removed and the respiratory movements are fairly adequate, oxygen is administered by mask or cone. If respirations are absent or inadequate, the properly sized endotracheal tube is inserted and oxygen administered by manual assistance via the gas ma-

chine. When restoration of adequate oxygenation has been accomplished, one may again aspirate the upper tracheobronchial tree through the endotracheal tube with a polyethylene catheter. When the respiratory response becomes adequate, the endotracheal tube is withdrawn and the infant placed in an oxygen-rich atmosphere until conditions have stabilized at normal levels. In all cases of prolonged or difficult resuscitation, the infant should be placed in a moist atmosphere with oxygen for twenty-four hours or longer as indicated. Alevaire® may be used if preferred. We carry out this procedure of endotracheal aspiration and moist atmosphere as a routine in most of our section cases also, for they are more prone than the vaginally delivered to develop atelectasis and hyaline membrane disease.

It might seem that some of these steps would be difficult to carry out, but direct laryngoscopy in the infant is relatively easy and with very little practice one may become adept at it. A simple review of the anterior position of the laryngeal fossa in relation to the esophageal orifice will correct many of the errors we make in first doing an endotracheal aspiration. I have long felt that this vital maneuver, which is not difficult to master, has been neglected as a technique which should be taught to our medical students. Certainly, there are numerous instances in addition to those mentioned where the ability to carry out direct laryngoscopy and endotracheal aspiration could mean the difference between life and death for one of our patients.

In conclusion, let me emphasize once again three salient points. First, in respiratory problems think first of oxygen; second, remember Nalline as the antidote for narcotic drug intoxication; and, third, have available and learn to use simply equipment for carrying out endotracheal intubation, aspiration and ventilation.

ABOUT CHRONIC DISEASE

The greatest health problem facing the state today is how to expand and improve services and facilities for the mounting number of chronically sick. The increasing urgency of this problem is closely related to the rapid, continuous increase of people over sixty-five years. Older people suffer disproportionately from chronic disease; almost 45 per cent of their illnesses are due to chronic disease.

In 1900 only 22 per cent of the total deaths in Minnesota were among persons sixty-five and over,

while in 1950, 61 per cent of all deaths occurred in this older age group.

In effect, then, the state is confronted with an increasing number of oldsters living longer with their disabilities; an increasing demand for medical and allied medical services and facilities; the continuous heavy cost of such care often producing pauperism in an otherwise economically stable population; and the greater tax burden on a proportionally decreasing taxable population.—*Minnesota's Heath*, January, 1957.

Allergy

A Round-Table Discussion

JACOB BLUMENTHAL, M.D., Moderator
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LOWELL HENDERSON, M.D.
Rochester, Minnesota

ELMER T. CEDER, M.D.
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DR. BLUMENTHAL: An allergy is an altered reaction capacity of the tissues of certain people. It is the altered reaction of their cells to their world about them. Now, of course, it is clear that a definition so inclusive would encompass all altered reactions, pathological and physiological. However, the term allergy has become very markedly restricted in use and concept to that group of altered reactive diseases in which there is a large hereditary factor, the production of specific antibodies called reagins, increased tonicity of smooth muscles, and symptoms of vasomotor origin. But even in this limited sense, it is the pattern of tissue response which is fundamentally important, and the same manifestations may be elicited by a wide variety of stresses and strains and stimuli. Allergy has become integrated into many fields of medicine: dermatology, ophthalmology, pediatrics, internal medicine, and, most certainly, general practice. But in spite of this, we in the field of allergy, have limited our work to the narrow concept of the term, realizing full well that everything that itches and sneezes and wheezes is not allergy. It is at times very hard to make a diagnosis between a true hypersensitive state and other conditions in medicine.

Rather than go into all of the various ramifications, I would like to answer a few of the questions of general interest which have been asked. The first question we should like to consider would be the treatment of hay fever. There has been a lot of controversy recently as to whether the steroids or antihistamines have taken the place of desensitization.

Hay fever is a good starting point because it is the most simple, apparently, of all the allergic conditions. Dr. Henderson will talk on that.

DR. HENDERSON: By hay fever I assume that you mean the seasonal variety that we think of

as caused by pollens of trees in the early spring, grasses in the late spring, and weed pollens in the fall. Hay fever of this simple seasonal type seldom lasts longer than about six weeks in Minnesota, and usually responds very well to the common measures of avoidance of the offending irritant as much as possible, symptomatic treatment, and, if necessary, desensitization. The important thing in avoiding the pollens is staying inside as much as the job or the activities permit. Air conditioning is very good in most of these cases. Going away on a vacation is another way of avoiding it. Unfortunately, the vacation spots are getting farther and farther away, as the pollens seem to be spreading, particularly the ragweed pollens. But as I talk to my patients with hay fever, I put as the No. 1 effort in managing it the avoidance of the pollens in the first place.

The second thing, then, is symptomatic treatment. If the patient has avoided the offending irritants fairly well and still has some symptoms, then the antihistamines are the next thing to consider. As far as the antihistamines are concerned, I have no great preference. There are about half a dozen that I think are fairly good, and it's a matter of trying one or trying another, letting the patient find which one gives him the most help with the least side reactions. Many patients will complain of grogginess on the very antihistamine that seems to stimulate another person. Someone else will get a dry throat, while another person tolerates it very well. An antihistamine which will help one person may be of no help to another. I very often write small prescriptions or give out samples of one or another type, trying to encourage patients to take one for two or three days at a time. They do that until they get one that gives the most help. We have seen no bad effects from antihistamines. I know there are a few instances where there have been reactions, such as bladder symptoms caused by taking antihistamines orally, but we have had no trouble. We use

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other treatments, such as are indicated in the way of cold packs for the eyes, some adrenalin, and boric acid eyedrops, and anything along that line. We have seen very little help from antihistaminic eyedrops or antihistaminic nose drops. Now, if those two things aren't sufficient to enable a person to get along fairly well, the third thing is desensitization. We try to get the patient to come in a few weeks ahead of the pollen season to start the desensitization program. Many of them will bring up the question, "How about the steroids? Can't I avoid all this by just taking the steroids?" And our answer definitely is *no* to every one of these patients, because it just doesn't make sense to take as potent a medicine as the steroids for something which, at the most, is usually a nuisance type of thing, particularly if the patient will observe some of these common sense measures.

Now, we have had a few cases where everything else has been done—avoidance of pollen as much as possible, air conditioned living quarters, antihistamines, desensitization, following our instructions totally—and still the patient was miserable. Then there are some of the local businessmen who felt they couldn't get away but have done everything else. To some patients of this type we have given steroids for about four days. Usually this is in the ragweed season, and by about the 28th or 29th of August they are really up against it. We give them steroids until about the first, second or third of September. Usually within another week the pollens begin to subside anyway. I think that we have treated a total of about fifteen different patients like that, none of them getting steroid therapy for more than about six days at the most. These have all been patients who have tried every other type of treatment. They understood that the steroids would be stopped after three to five days, even if the symptoms did return. On that basis we have gotten along very well. I will say that we considered all contraindications and didn't give the steroids to patients with any of the usual contraindications.

DR. BLUMENTHAL: Thank you, Dr. Henderson. I agree essentially with what you have just said. A desensitization that is well done will give about 80 or 85 per cent very good results. About 10 per cent will not get results from desensitization. I feel it is the method of choice in the serious hay fever victims, the ones that are not

getting relief from the antihistamines. My experience with the antihistamines is that with sufficient dosage the patient will go to sleep. If not enough is given, nothing happens. My experience has been that desensitization usually has to be resorted to unless the patient can avoid the causes. It is very hard for a patient to get away, as in ragweed pollinosis, for six weeks unless he happens to be in an unusual position.

The next question is really a very difficult one—at least I think it is. It is in the form of two questions: Is eczema in the adult due to a food allergy—how can one handle it; is infantile eczema an allergenic phenomenon?

DR. CEDER: These are certainly two very difficult questions, particularly the question about infantile eczema being an allergic phenomenon. Many papers have been written by dermatologists, pediatricians, and allergists on the investigation of the allergic etiology in this disease. Of course, one first must differentiate between what we call atopic eczema and seborrheic dermatitis, but that cannot be done in the short time allotted. But let us assume that the child is what we call an eczematous, non-seborrheic child, coming from an atopic family with either hay fever or eczema in the background, and that the eczematous areas developed soon after birth over the arms and may even be extensively widespread. The general consensus of the American Academy of Dermatology is that they feel that the management of atopic eczema is chiefly topical. The role of foods in preventing, controlling, and curing this condition is quite equivocal. Dr. Louis Webb Hill, a prominent Boston pediatrician, who has been a student of the condition for a number of years, has written extensively on the subject and has come to believe that he cannot control eczema by eliminating foods alone. For example, the skin tests that are performed by passive transfer usually show a marked reaction to egg albumin, wheat, and milk, chiefly cow's milk; and the children are generally placed on substitutes for those. But in my experience, I do not believe this is too important. I can generally bring them under control with topical preparations within a few weeks, and treat them with the normal pediatric diet.

Now, the question has been raised that there may be some environmental allergy, particularly in the inhalants. Dr. Stephan Epstein of Marshfield, Wisconsin, has gone into that. He feels

that is quite a prominent allergy problem, probably more so than in foods. On the other hand, he feels that he can control infantile eczema by adjusting the diet as well as the atmospheric or environmental factors.

As far as adult eczema is concerned, this same infantile eczema generally will go on into adult life. It's quoted that about 30 per cent of these children outgrow their eczema in the first six years of life and become nonreactive. Some will have a period of quiescence or latency between the ages of ten to sixteen, we will say; then they will have another exacerbation. These represent about 20 per cent. This recurrence will continue on into adult life, usually up to about thirty years of age. Now, the reason that I mention this is that if this were an allergy, would there be these intervals of freedom from reactive allergies in a certain age group, with recurrences later? Furthermore, it's quite a common observation that this type of eczema, the so-called atopic eczema, is much more prevalent in winter than in summer. As a matter of fact, approximately 90 per cent of persons with atopic eczema are relatively free of symptoms in the summer months. This period of freedom cannot be explained by the deletion of foods from the diet because the diet as a whole is the same, winter and summer. The only difference would be that in the summer we eat extra foods such as fruits and melons, and that wouldn't account for the condition in winter. I can't believe that an allergy would perform in that fashion unless there were some atmospheric explanation, which there does not seem to be. Dr. Howard Osborne of the University of Buffalo is a great believer that dust in homes is the answer to the seasonal occurrence. He suggests that carpeting, wool clothing, and blankets should be scrupulously removed from the person with eczema.

As I said, this is a very controversial subject. Dermatologists as a whole have learned, however, that they can control the condition with topical remedies.

DR. BLUMENTHAL: Thank you, Dr. Ceder. In connection with this subject, there was a very pertinent question asked here: Does infantile eczema tend to develop into asthma when the eczema subsides; also, does the body switch from an eczematous stage to an asthmatic stage; and when one reaction subsides, is the other apt to be reactivated?

Anyone who has been in practice any length of time can't help but be impressed with the fact that a large proportion of these children with childhood eczema develop asthma. When they develop the asthma, their eczema very often disappears. They switch from one to the other. That has been my experience. Would you care to comment, Dr. Henderson?

DR. HENDERSON: I agree.

DR. BLUMENTHAL: Dr. Henderson says that has been his experience; and I think it has been the experience of most men in practice.

Now, there is a question here that I am particularly interested in. It has to do with skin tests. I have written a good deal about it, and I am very much interested in skin tests. I think they are abused a great deal. I think they are extremely useful in many ways because sometimes when nothing else whatsoever will give you a clue, skin testing will. Skin testing is an interpretive process. The question here is, what are the hazards of anaphylactic shock in skin testing? I think these hazards are overestimated. I think it is advisable to do scratch tests first; then if they are negative, to do intradermals. In the aged, where the skin is atrophied and reactions are extremely difficult to read, I have been inclined to use intradermals. In patients with rhinitis, I have been inclined to do intradermals; on patients with asthma, particularly young people, who have a tendency to react very, very strongly, just as they do to anything else, scratch tests are used. After all, you are testing a shock organ. I think in these cases you have to be extremely careful. Shock is rare, of course, but I know that anaphylactic shock can occur. Be sure that you get a good history of allergy before you go ahead with it. When, for instance, a patient says, "Doctor, I am very sensitive to cats," it would be a foolish thing to do skin tests with cat hair.

DR. HENDERSON: I have used intradermal testing with more dilute solutions, such as 1:10,000 solution, which I feel is roughly equivalent to scratch testing. I think if you have only a very small amount, just enough to raise a site—perhaps only 1/200ths of a cc. of material at most—this small amount of such a dilute solution will not cause any trouble. It's foolish to ask for trouble by giving material to which a person is very

definitely sensitive. For instance with cat or other animal danders, in which treatment it's going to be a matter of avoidance anyway, rather than desensitization, skin testing is not necessary. If the physician uses common sense in this regard, and very, very small amounts of material, the likelihood of trouble is very remote.

DR. BLUMENTHAL: We have a question here which I think will interest all of you. Describe the efficacy of poison ivy extracts, both prophylactically and for use after exposure. What is the period of time that it takes to react to poison ivy after exposure? I think this is in the field of Dr. Ceder.

DR. CEDER: Well, Jim Blake made a statement once that the only person who benefits from poison ivy extract is the doctor, because he gets the fee for giving it. As a matter of fact, the efficacy of prophylactic poison ivy extracts, in the past, has generally been regarded by dermatologists as being of very little value. That was based on the old commercial extracts made from the oil suspension of the oleoresins. Most of those extracts were administered in an irregular fashion and usually only a very short time before the season occurred, and the patients as a whole didn't get much protection from them. However, recently in the literature we read about considerable modification of these extracts which is going on. One article is by Dr. Kligman of the University of Pennsylvania. He is evaluating by administering it to a thousand individuals, and he believes that he can produce what is known as hyposensitization. This is not complete protection. In other words, the patch test using the material will still be positive, but from season to season the patients' reactivity is much reduced, but it isn't complete protection. There is another paper in a recent issue of the *Journal of Allergy* on Aqua-Ivy. This is a preparation that is an alum precipitate of the allergen, and is administered at specific intervals over a period of time. It also induces hyposensitization.

Now, again the reaction of the skin, *per se*, will still be about maximum; but there is more systemic response with this. The only real objection is that you cannot achieve a complete desensitization because poison ivy doesn't produce circulating antibodies. That is true of most epidermal irritants, such as ragweed dermatitis

produced by ragweed pollen. But in general we still feel that there is very little value in using the previous commercial extracts as a prophylactic remedy. Therapeutically, I can be a little more dogmatic. We know it's quite hazardous to administer extracts of high potency to a person who is already having a dermatitis from poison ivy. You can get an exacerbation and aggravation of it by the Shwartzman phenomenon; even fatalities have occurred. I have seen severe reactions from it, and it should not be administered at that time. I am quite sure it does very little good. Dr. Howell of Dallas had a group of patients who received extracts of a certain potency; his controls were another group who didn't get any. He compared them, and the course of the disease was the same in both groups.

Now, considering the question of how long it takes for dermatitis to develop after exposure to poison ivy—well, there have been some studies done on that. Generally it occurs within twenty-four or forty-eight hours. It can occur as late as a week after, but the greater percentage will develop lesions within forty-eight to seventy-two hours.

DR. BLUMENTHAL: Thank you, Dr. Ceder. Now we come to one of the most serious problems in allergy, and that is asthma. There has been considerable controversy as to the present status of the treatment of asthmatic patients. The problem of using steroids, or of using the older, more conservative methods of treatment is still being discussed. I think there are very few men in this part of the country who are more qualified to speak on that phase of it than is Dr. Henderson.

DR. HENDERSON: I think we have to divide asthma up into the seasonal type produced by some known precipitating factor, the kind that comes on or gets worse when the hay fever is at its worst, and the perennial type that may be due to combinations of known factors and unknown factors. I think for simplicity we can say most of those cases actually can be classified under asthmatic bronchitis rather than under true allergic asthma. Too many people, both physicians and patients, are using the steroids in both types of cases. The seasonal type of asthma I think we can dispose of fairly simply by saying it is a rather short-term type of thing, due to the

limited season of the offending agent; and the same thing in prevention holds true there, as for hay fever (i.e., avoiding the irritants). In this case we are justified in urging the patients to go to greater lengths to avoid the irritants than we are with hay fever. If he needs to quit work for two or three weeks, have him plan to take his vacation during that time. If he needs to spend enough money to get a room in the home satisfactorily air conditioned, we feel that it is worth while in the case of asthma, even though it may not be the case in hay fever. It is just a matter of what the patient will put up with in the way of a nuisance. In the case of asthma we need to impress on the patient the future course of the disease and that eventual disability may result from complications of asthma, particularly emphysema. In any case of asthma we should proceed with a view to a long term treatment; start out with the assumption that it's a difficult disease to manage and we are going to have to go "all out" to take care of it.

In the asthmatic bronchitis cases we are going to be confronted with the situation where the patient is in distress, has symptoms of cough and wheezing, often sitting up at night to get his breath, and requiring a doctor's visit. This many times builds up a great fear in the patient that perhaps he cannot reach the doctor in time to get help, so we have a large psychogenic factor in a great many of these cases of asthmatic bronchitis. Then the patient hears of some friend who has had some of the steroids, and is getting along fine and having no trouble at all. "Why can't I have that instead of fiddling along with this suppository and this shot?" he asks. In the first place, you have to sit down and have a talk with these people and outline their status as far as the future, long-term care of the condition is concerned. Usually at the same time you talk to them about the hazards of the steroids. I am very frank with these people and perhaps at times overemphasize the statistics in order to make them fully aware that they can't take steroids like aspirins or the antihistamines; they are more of a last resort type of treatment rather than the first type to use. After that is understood and we have checked on any skin tests that might be indicated for specific factors, then we start talking about eliminating respiratory irritants in general. In a lot of these cases where skin tests are unhandy to do, you can get by perfectly well without them,

particularly in older people. You may have some pretty good ideas as to whether dusts, temperature changes, dampness, drafts, or anything similar are particularly bothering him. You can get some idea as to whether a pet is causing the trouble. In general, whether the skin test is negative or positive in this group of people, I tell them they ought to have a bedroom as lint-free and dust-free as possible; to sleep in a warm bedroom that is draft-free, and to get rid of the feather pillow, not particularly because they are feather-sensitive but because the pillows are another source of dust and mold. It is good to have the bedroom floor bare or with linoleum or linoleum tile, or washable rugs. Get rid of venetian blinds and drapes, and have no pets with hair or feathers in the house. This means that dogs, cats, parrots, parakeets, and that type of thing should be eliminated. If the patient is a farmer, we talk about how he can eliminate some of his contacts, and maybe some jobs that he has been doing that he can avoid; perhaps he has help to whom he can delegate some of the jobs that are particularly dusty or dirty. An oronasal mask is something not to be overlooked. A lot of times a farmer who has to be in the barn throwing down some feed, milking cows, or something like that, can avoid a good deal of this contact if he wears one of these masks made out of plastic or rubber with an adequate filter disk of some kind. They usually run to \$3.00 to \$5.00, and are available at most pharmacies. A farmer can do a good deal of work using one of these, but there is a certain respiratory lag which makes them rather undesirable for certain work. So we proceed on the avoidance of irritants of all types as much as possible.

Then the second thing is to talk to them about symptomatic treatment. Many of them have taken medicine that made the heart speed up; they felt that they would be better off simply to sit up until the wheezing subsided, thereby getting back to a rather uneasy sleep without taking any medicine. I reassure them that most of the medicine used for asthma that causes the speeding up of the heart does no more harm to the heart than when they walk upstairs, and that it's a physiologic symptom. If they are having enough trouble to warrant taking some medicine, they should take it by all means.

I try to outline for them the classifications of medicines—the quick-acting ones, the shots and

inhalants; and the slow, more prolonged-acting ones, such as the ephedrine compounds, which, combined, complement each other.

The third type of symptomatic treatment is the iodide preparations. I don't think they ought to be sold short at all. Many times a patient has been taking a good deal of the ephedrine compounds but is troubled with a cough, and dry, sticky mucus. Our average dose of potassium iodide is ten drops of saturate solution three times daily in a glass of water. I warn them of the possibility of a rash, and instruct them to drop the dosage if a rash occurs. Often they can tolerate a smaller dose of a size that will still be helpful. Also aminophyllin suppositories can be given for nighttime use in patients who have a lot of nocturnal trouble.

So we go through the whole program of avoidance and symptomatic treatment. Then the third thing is to consider desensitization, if there are some specific irritants that we have reduced to a minimum but with which the patient is still having some contact, I think we can assume that in most chronic asthmatic bronchitis, desensitization will not be as helpful as in the seasonal type of asthma. There is a large mechanical factor to consider. In some of these patients, even though we found house dust sensitivity by

skin tests and have desensitized the patient to the chemical substance in house dust, there is a good deal of mechanical irritation on contact with it and they can get symptoms even though they are desensitized. For that reason I am not so anxious to start a desensitization program in chronic asthmatic bronchitis, even with positive skin tests, as I am in the seasonal type of case.

Now, we come to the steroids and they are the last thing; I say the last because that is where I think they belong. If we have a patient with asthma severe enough to warrant hospitalization despite having followed a good conservative program, then I think that it's time to treat him with the steroids. We start them with some intravenous preparation, and then follow with oral medication for a few days. We try to stop the preparation after four, five or six days of treatment. Many of those who come to us have already been on the steroids and have run into trouble because they haven't paid adequate attention to the more conventional measures, and have gotten into trouble despite the steroids. In these people you have to go ahead with the steroids, at least for a while, until you can swing back into the other measures. The aim with steroids is always to treat the patients as short a time as possible, then to discontinue steroid therapy.

MODERN INSECTICIDES CAN BE MENACE TO HEALTH

A bulletin from the Minnesota State Medical Association warns that accidental poisonings from the misuse of modern insecticides are alarmingly frequent. It is vital that the public become aware of their potential dangers and learn how to use the compounds properly. Many of the more highly poisonous organic insecticides are restricted to agricultural uses. Individuals working with these compounds know that it is essential they wear protective clothing and goggles when they are engaged in their work, for poisons like Parathion, TEPP and HETP can be absorbed through the skin, respiratory tract and eyes as well as the gastrointestinal tract.

Insecticides may be used safely by following these ten simple rules:

1. Read the label carefully; follow instructions and observe the caution statements.
2. During use, avoid inhaling sprays or dusts and be careful not to spill any on your skin. If you do, wash immediately with soap and water. If your clothing becomes contaminated, remove it and wash it before you wear it again.
3. When dusting and spraying fruits and vegetables

in your garden, do not allow insecticides to come in contact with the edible portion of the plant.

4. Indoors, avoid food contamination by covering all food, food utensils and food preparation areas while spraying.

5. Do not spray children's toys, cribs or clothing.

6. Do not spray rooms occupied by infants or sick people.

7. Never store unused insecticides in empty food or beverage containers, food cupboards, medicine cabinets or other places where there is danger of food contamination or mistaken use. A high shelf or locked cupboard is a good place for storage.

8. Always keep insecticides and insecticide poisoned bait out of the reach of children and pets, even during the times you are using them.

9. Dispose of empty containers immediately where children and pets cannot get to them.

10. Do not use insecticide vaporizers or fumigators in your home.

Pharmacology for the Family Physician

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ONE OF the most interesting groups of new drugs in recent years is the ataractic, or tranquilizing, drugs. These drugs have come into great usage in recent years. They have actions something like the hypnotics, and in some respects something like the opium analgesics. In other words, all of these drugs act chiefly upon the central nervous system. Since they have similar actions, a description of the ataractics and a comparison of them with some of the effects of the hypnotics, particularly the barbitals and the opium analgesics might be interesting.

The ataractics as we know them today are made up of the following: Reserpine, an alkaloid from a crude plant which comes from India, which is used in various doses; the French introduction, chlorpromazine or Thorazine, which is used in doses beginning at 60 to 100 milligrams; meprobamate (Miltown or Equanil), which is used in beginning doses of 100 to 200 milligrams; azacyclonal, or Frenquel, the dosage of which begins with 15 or 30 milligrams; and promazine or sparine, the dosage of which, like chlorpromazine, begins at about 100 milligrams. There are two or three other drugs in the process of being introduced and which are experimental. The principal pharmacologic property of these drugs is to block the reactions and the behavior produced by exaggerated emotions. These emotions are tension, excitement, anxiety, fear, anger, worry, and probably some forms of emotional pleasure. These emotions, especially anxiety and fear, as you know, can produce rather marked disturbances and even pathologic behavior. At times, this leads to the patient's being emotionally disturbed and the final result is hospitalization.

An experimental example of the type of effect produced can be seen if one of these drugs is given to a monkey. You all know monkeys well enough to know that if you go up to a cage containing a monkey, it quickly becomes excited. If one reaches into the cage to pick up the monkey, it will bite and claw. If the monkey is first

given a drug, such as chlorpromazine, and then it is picked up, it is almost as gentle as a cat. This is the type of action we have never seen before in pharmacology.

How is it produced? We don't know the whole story, but it appears these drugs act upon the hypothalamus or associated subcortical structures. In other words, their effect is entirely at the base of the brain. It is known that in the region of the hypothalamus there are areas where one can apply an electrical current which produces what appears to be strong emotions in an animal. One can cut regions out of the hypothalamus, and one gets the direct opposite effect, placidity and lack of emotions. That is the evidence supporting this theory of action. These drugs appear to depress the hypothalamic region. We don't know if it is the hypothalamus or associated structures, but I will call it the hypothalamic region for lack of a better term. In addition, they reduce the effect of the hypothalamic region on the higher centers of the cerebrum. Impulses arise and produce strong emotions in the hypothalamus; other impulses are then sent up into the cerebrum to produce excitement and the other phenomena of emotion.

Now, the significant thing is that the highest mental processes—as for example, judgment, attention, learning, and perception of sensation—are affected little or not at all. In other words, mental activity after taking an ataractic drug is more or less normal. If the exaggerated emotions produce insomnia, these drugs will produce sleep; but if a really severe insomnia is present from other causes, the ataractic drugs probably will not produce sleep.

I want to go back for a minute and discuss the experimental technique for studying these drugs. One of these was introduced by Joseph Brady of the Walter Reed Army Hospital in Washington. It has to do with behavioral tests which came out of psychologic research. The experiments are carried out on both rats and monkeys. The animals, after being deprived of food or liquids for

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twenty-four hours, are placed in a container where they learn to press a bar to obtain small amounts of food, or a drop of liquid, such as orange juice. With practice, the animals will learn that they will only get food or water by pressing this bar. After a time, they will do this so routinely that one gets a perfectly straight curve of their food or water intake. After the animals have learned this, another stimulus is added. This is a clicking noise which lasts for three minutes and terminates in an electrical shock administered to the feet of the animal. The animal soon learns to recognize the auditory stimulus terminating in a shock by showing a fear or anxiety reaction. This reaction consists of crouching, with or without defecation, and a marked reduction in bar pressing. During this anxiety reaction, the animals just stop pressing the bar. The three minute anxiety-producing stimulus is given at seven-minute intervals. Drugs can affect this experiment as follows: Amphetamine, which, as you know, is a cerebral stimulus, leads to a 100 per cent increase in bar pressing during the seven-minute or so-called control period; whereas during the three-minute anxiety period, bar pressing is reduced completely to zero. On the other hand, with reserpine, bar pressing is reduced 50 per cent during the seven-minute control or anxiety-free period whereas during the three-minute anxiety-producing period, the animals go ahead and press the bar normally. In other words, inhibition to bar pressing is removed with reserpine. This drug either obliterates anxiety or prevents the reaction from it. During the anxiety-producing period, the animals go ahead, press the bar, and eat or drink normally.

A similar type of experiment has been conducted by Heistad at Minnesota, using chlorpromazine in rats treated in a similar manner. Rats given two and a half milligrams of chlorpromazine per kilo—that is a reasonably good-sized dose for a human being—showed a reduction of the anxiety or fear reaction, but not so great or complete as Brady got with reserpine. Those are the only two experiments that I know that give you this comparison. I believe the results are comparable.

In addition to this effect in the hypothalamic region, the blocking of anxiety, fear, et cetera, there are some other effects produced by these drugs. This occurs because, in the hypothalamic region, there are other nuclei controlling or pro-

ducing a lot of other effects in our bodies. All these nuclei are so close together that it is very difficult to separate one from the other. Here are some of the things that happen: The hypothalamic region controls our homostatic mechanism—circulation, respiration, digestion; and close by is the hormone master gland, the pituitary. That means the hormones also play a role in controlling these activities. Stimulation studies have shown that circulation, respiration, digestion can be affected from this region. These drugs, as you know, lower blood pressure. This is rather a common reaction. This effect is probably central, due to a depression in the hypothalamic region. Reserpine can increase motor activity in the gastrointestinal tract and increase the hydrochloric acid secretion. This at times is a dangerous effect. On the other hand, chlorpromazine does the reverse. It depresses the gastrointestinal tract and probably reduces the hydrochloric acid secretion. All of these drugs can lower body temperatures. If large enough doses are given, the temperature will become subnormal. There is an emetic center in this region, and these drugs are the most markedly antiemetic substances known in animals. In addition, there are fiber tracts going through the area which are extremely important in correlating the subcortical parts of the brain with the cortex. One of the fiber tracts is the reticular activating system. This system, when it is stimulated, produces a marked awakesness or alertness. You all know that under excitement an individual becomes wide awake. This is undoubtedly due to the reticular activating system sending stimuli up to the cerebrum. This system is depressed by at least one of those drugs, but not markedly so, and that is chlorpromazine. A depression of the reticular activating system should lead to quiet and tranquillity. You notice I am using the terms quiet and tranquillity in referring to the ataractic drugs, and I am keeping hypnosis and sedation as terms for the barbitol action.

There is another area in the hypothalamic region called the amygdala. We have known for a long time that when the amygdala shows electrical activity, it sends impulses into the hypothalamus and quiets it. In other words, increased activity of the amygdala will make the hypothalamic nuclei more quiet. It's been shown that chlorpromazine increases the activity of the amygdala. In other words, if this is the principal mechanism of action,

and it looks as if that may be the case, here is a drug that increases the activity of one part of the central nervous system to depress other parts of the central nervous system.

Furthermore, in the cat, chlorpromazine, given in larger doses, produced a marked increase in the electrical excitability of the entire brain stem and the entire cerebral cortex, leading to grand mal seizure. That has been seen clinically—and likewise convulsions have been seen under chlorpromazine. It looks as though at a certain dosage level one can markedly increase the passage of impulses through the entire nervous system.

Meprobamate or Miltown has quite the opposite effect. When given in large doses to animals, it produces a very remarkable flaccid paralysis that is reversible—complete relaxation of muscles. Meprobamate is also antagonistic to strychnine convulsions. It is possible that in a patient on this drug, in addition to the ataractic effect, relaxation of muscles may also be an advantage.

Briefly, these are the important effects of the ataractic drugs. As you can see, they are rather striking, and a little bit different from anything else we have ever had before. Now let's briefly consider the barbitol hypnotics and point out some differences and similarities.

The barbitol hypnotics, as we have known for a long time, produce a uniform depressant action on the entire central nervous system. During this effect the electroencephalogram shows a typical picture of sleep. The direct opposite is true from the ataractic drugs. The action of barbitol, as you know, leads to hypnosis and sleep, and ultimately with suitable doses to general anesthesia. This cannot be done with the ataractics. In the action produced by the barbitol hypnotics, it is important to remember that the highest mental activities are depressed: Auditory reaction time is reduced, memory is dull, and motor responses all go down below normal, just as is the case with alcohol. This is a striking difference to the ataractics. Emotions probably are also depressed by the barbitals. Large doses show that the barbitals relax muscles. The overall action of barbitals can now be summarized by saying the action is similar to a decerebration. There occurs also a slight drop in blood pressure, slowing of respiration, and an anti-emetic action.

The action of morphine is much like that of the barbitals plus an extensive depression of the pain centers. Probably this is chiefly cortical. One

gets the same hypnosis, the same tendency to sleep, plus a striking elimination of the sensation of pain. The highest mental processes again are markedly depressed and the hypnosis is marked. There is undoubtedly also a marked effect of morphine on the emotions—a loss of emotions which leads to a striking picture of indifference.

Many people studying pain have noted that human beings given morphine will not complain of pain. If one asks them about it, they will say, "I feel it, but I don't give a damn about it." In other words, this is similar to the reaction one gets with the ataractics. Morphine also will stimulate the vomiting center, it may depress respiration, and it will lower blood pressure very slightly. You can see there are similar points of action in the three groups of drugs, all of which act on the central nervous system.

If this is the case, what happens if one gives some of these drugs together? We don't know the whole answer, but here are some suggestions. It's been reported that the ataractics plus morphine give better pain relief. As far as pain itself is concerned, that probably is not true. The best workers have found that the control of pain produced by morphine is just as good as when an ataractic drug is added; but that the ataractic drug may increase the control of emotions and produce more indifference. There are times in the history of a human patient where you have a tremendous emotional disturbance where an ataractic plus morphine or any other analgesic may be superior to the use of morphine alone.

The sleeping time in animals produced by the hypnotics, more particularly the short actors, is definitely prolonged in the ataractic drugs. In fact, this is one of the experimental tests of an ataractic drug. Whether it is a good test or not, we do not know.

This prolongation of the sleeping type of hypnotics may be due to the depression of the activating system by the ataractic drugs. The general anesthetics are also potentiated with the ataractic drugs, and so is alcohol. However, there is the possibility that these drugs may over depress the hypothalamic center and lead to over deep anesthesia, which may be dangerous.

These drugs came into use in psychiatry chiefly, where they were used to control excitement, delirium, tension, agitation, anxiety, worry, fear and depression. Yet today these drugs are being used

more outside psychiatry than inside it. The symptoms I have mentioned, such as excitement and anxiety, are not of extreme danger, for every normal individual at some time experiences one or more of them. Most normal individuals learn in the process of growing up how to use these emotions for improving their education, improving their living conditions, improving their association with other individuals. So it can be said these emotions do serve a useful purpose. How many of us would have graduated from medical school if we had not experienced anxiety. In other words, anxiety and worry are things to help us to grow up and are absolutely essential in our lives. So we can't say we should eliminate them from life entirely. At times the stimulus leading to one or more of these emotions may be extremely intense and prolonged—for example, during a catastrophe or during a limited illness, such as delirium tremens. In some of these instances, a physician is justified in using one of these drugs. On the other hand, in certain diseases such as schizophrenia, where these symptoms become extremely marked and lead to such an alteration in behavior that the individual has to be hospitalized and cannot take care of himself or herself, these drugs have produced rather remarkable results. The barbitol hypnotics will also relieve emotions. A schizophrenic patient can be given a barbitol, leading to control of the emotions. He will then become quiet, but, in addition to this, he becomes sleepy, and will show disturbed or dulled sensations and various degrees of motor incoordination. This person cannot take care of himself or herself. On the other hand, the ataractic drugs act by blocking or inhibiting some of the relay centers in the pathway associated with abnormal behavior only, thus leaving the cerebral areas necessary for our highest mental processes in a comparatively normal condition. This will result in an individual who can be up and around, who is reasonably alert mentally; and who can take care of himself and get along with other people in his surroundings. This is a step forward in the treatment of these patients.

It should be emphasized that these drugs produce only symptomatic relief. There is no evidence that they are curative. Unfortunately, the use of these drugs has brought with it a number of side effects. Chlorpromazine may cause extrapyramidal disturbances like Parkinsonism. Sometimes only

after a disturbance of this type will the drug show ataractic action. This disturbance suggests increased transmission of motor nerve impulses; which can be controlled with a drug like Artane. Chlorpromazine may produce convulsions or jaundice. When this occurs, the drug should be discontinued. One school of thought believes this is due to an obstruction in the biliary passages and suggest the administration of the drug should be continued. A symposium in New York City last June was strongly in favor of this viewpoint. Another school of thought believes that the jaundice is an allergic manifestation and the drug should be discontinued.

Both reserpine and chlorpromazine have been known to produce a depressive psychotic reaction. This is important. Two hundred such instances have been reported from reserpine as of last June. This suggests these drugs will change the emotional status of human beings, but not always in the direction of normalcy. For this reason reserpine probably shouldn't be used in the depressive stages. Because reserpine increases gastric secretions, it should not be used in a gastric disturbance.

For this reason, the Food and Drug Administration recently suggested reserpine be used cautiously. They found in studying the use of reserpine in the United States that a dose of .32 milligrams per day raises gastric secretion and gastric acidity in a significant number of cases. A dose of half a milligram per day in two weeks raises gastric acidity in most patients. An occasional massive gastrointestinal hemorrhage and ulcer perforation have been reported at half a milligram of reserpine per day. A half to one milligram a day produces severe depression and has resulted in a number of suicidal attempts among human patients. A dose of three-quarters of a milligram and up should be given to patients only in a hospital. The only dose safe to give a human patient as far as we know today without producing any of these disturbances is a quarter of a milligram per twenty-four hours.

The barbitals are habit forming; morphine and its synthetic derivatives also are habit forming. The pharmacologist failed to find these actions in the laboratory until after physicians found such effects in human beings. It may be the same way with the ataractic drugs. There is evidence that

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Seminar

Pulmonary Fibrosis

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PULMONARY fibrosis is an anatomic descriptive term that earned wide acceptance as a diagnosis for poorly understood respiratory illnesses casting persistent diffuse shadows on the roentgenogram during life and revealing scar tissue in the lungs at necropsy. As understanding of pulmonary disease matures, the obligations of the clinician become more exacting; thus, he no longer is permitted the luxury of this generalization but must qualify the categorical term "pulmonary fibrosis" as related to some known cause or by pathologic and physiologic description, such as pulmonary fibrosis secondary to Boeck's sarcoid, pulmonary fibrosis following streptococcal pneumonia, pulmonary fibrosis of berylliosis, or diffuse interstitial pulmonary fibrosis of Hamman and Rich.

Pathologists have known for a long time that minor degrees of pulmonary fibrosis are commonly seen at necropsy. The clinician is concerned only with those types of fibrosis which are manifest during life. Definitively, therefore, pulmonary fibrosis includes respiratory diseases associated with formation of fibrous tissue in the lungs of sufficient degree to be characterized clinically by abnormal roentgenographic shadows or functional impairment of respiration or both.

Pulmonary fibrosis should be distinguished from diffuse pulmonary disease. Inflammation, congestion and some types of neoplasms also cast shadows on the thoracic roentgenogram indistinguishable from those of fibrosis. The etiologic factors and the physiologic alterations of reversible inflammatory lesions may be identical with those of fibrotic lesions. The most reliable clinical evidence of pulmonary fibrosis is the persistence of roentgenologic shadows or of symp-

toms of respiratory insufficiency. The diagnosis, however, remains a clinical presumption until it is confirmed by histologic examination.

As recently as 1939, an etiologic classification of pulmonary fibrosis included only tuberculosis, silicosis, bronchopneumonia, chronic bronchitis, pleurisy and rare causes, such as syphilis and alcohol.¹ Rapid increase in clinical knowledge concerning this problem resulted in the more detailed etiologic classification of diffuse pulmonary lesions reported by King, in 1949.² This classification encompasses a wide variety of entities associated with or resembling pulmonary fibrosis as seen roentgenologically (Table I).

Normal Function of the Lungs

The primary function of the lungs is the exchange of oxygen and carbon dioxide between the body and the atmosphere. Actions concerned with acid-base balance, regulation of heat, water balance and reticuloendothelial processes are secondary. The aerobic cellular metabolism of the body requires replenishment of oxygen and excretion of carbon dioxide. Exchange of gases between the tissues and the circulating blood permits the metabolic demands of cellular oxidation to be made on the distant lungs.

The alveolus is the functioning unit of external gaseous exchange. The pulmonary parenchyma forms a framework through which courses a rich capillary network. The external exchange of gases occurs as a result of three closely integrated functions, namely ventilation, circulation and diffusion.

Ventilation.—The alveoli are connected to the exterior by the tracheobronchial tree. An alternating flow of air is produced by rhythmic alterations in intrapulmonary pressure, with respect to atmospheric pressure, induced by the repetitive action of respiratory muscles on the thoracic cage. This movement of pulmonary gases is pulmonary ventilation, and it has been referred to as the

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“bellows action of the lung.” The bellows action depends on the normal function of the muscular and nervous systems. The work required in ventilation is influenced by the viscoelastic properties

Effects of Pulmonary Fibrosis

Each major respiratory function, namely ventilation, perfusion and diffusion, may be affected by pulmonary fibrosis, depending on the location

TABLE I. AN ETIOLOGIC CLASSIFICATION OF DIFFUSE PULMONARY FIBROSIS
(FROM KING)²

Infections
Tuberculosis
Bacterial—streptococcal, micrococcal, brucellosis, tularemia
Mycotic—moniliasis, aspergillosis, coccidioidomycosis, actinomycosis, blastomycosis, histoplasmosis, torulosis
Rickettsial—Q fever
Viral—psittacosis, varicella
Parasitic—schistosomiasis
Inhalations
Industrial—silicosis, asbestosis, berylliosis, siderosis, bagassosis, byssinosis, vanadium, silver, talc, aluminum, barium
Other inhalations—vomitus, lipiodol, kerosene
Thermal injury
Neoplastic
Primary tumors—bronchogenic carcinoma, alveolar carcinoma, pulmonary adenomatosis
Metastatic tumors—stomach, liver, prostate, melanotic sarcoma, hypernephroma, tongue, thyroid, breast, pancreas, ovary, uterus
Generalized tumors—lymphoma, reticulum cell sarcoma, multiple myeloma
Blood dyscrasias—myelogenous leukemia, polycythemia vera, sickle cell anemia
Generalized systemic diseases—sarcoidosis, erythema nodosum, rheumatic fever, lupus erythematosus, periarteritis nodosa, Löffler's syndrome, tropical eosinophilia, cystic disease of the pancreas, xanthomatosis, amyloidosis, scleroderma, calcinosis
Fibrotic conditions—fibrosis, granulomatosis, bronchiolectasis, acute interstitial fibrosis, bronchiolitis fibrosa obliterans
Circulatory diseases
Pulmonary edema—without cardiac disease
Cardiac disease—pulmonary edema, hemosiderosis in mitral stenosis
Renal disease—pulmonary edema, hemorrhagic edema
Emboli and infarcts—phlebitis, lipiodol, fat

of the lungs. Normal ventilation requires relatively homogeneous distribution of atmospheric air to the various alveoli.

Circulation.—Circulation of blood to the alveolar capillary network is known as “perfusion.” The normal functions of the right ventricle and atrium, and the pulmonary vascular tree, as well as the great systemic veins returning blood to the right side of the heart, are integral parts of the pulmonary circulation. Normally, a relatively balanced relationship exists between ventilation and perfusion in the alveoli of various parts of the lungs.

Diffusion.—The passage of gases across the alveolocapillary barrier, or diffusion, is the third major aspect of pulmonary function and is dependent on normal ventilation and circulation. Changes in thickness or in the physicochemical nature of the alveolocapillary membrane or a reduction in its total surface area may result in impaired diffusion and hypoxia.

and nature of the pathologic changes. Extrapulmonary fibrosis decreases the elasticity of the thoracic wall, thus increasing the load placed on the pulmonary bellows and increasing the work of ventilation. Similarly, fibrosis may occur in or about major airways, decreasing their luminal diameter. The resulting increase in frictional resistance to the flow of air increases the ventilatory work load on the muscles of respiration.

The distribution of gases within the lungs may be altered by bronchiolar fibrotic obstruction. Ball-valve mechanisms in the smaller airways produce distention, rupture and coalescence of the distal alveoli, resulting in a loss of alveolar elasticity and a decrease in the alveolocapillary diffusing surface.

Perfusion of any given region of the lungs may be decreased by focal fibrosis of the pulmonary vascular network. When perivascular fibrosis is sufficiently diffuse, pulmonary hypertension develops to maintain the necessary flow of blood. Fibrosis of the alveolar or capillary walls, often referred to as “interstitial fibrosis,” may result in a

diffusion barrier despite relatively normal ventilation and circulation.

Appreciable degrees of pulmonary fibrosis may occur without symptoms of pulmonary insuffi-

The various aspects of pulmonary function are rarely affected individually. While ventilation is greatly impaired in emphysema, loss of diffusion surface also occurs. Pulmonary endarteriolitis

TABLE II. AN ANATOMIC-PHYSIOLOGIC-ETIOLOGIC CLASSIFICATION OF PULMONARY FIBROSIS

- I. *Anatomic: Parenchymal*
Physiologic: Reduced pulmonary volumes; may be asymptomatic unless extensive
Etiologic:
 - Postinfectious (primary and secondary to local bronchial obstruction)
 - Pyogens—streptococci, micrococci, pneumococci
 - Tuberculosis
 - Fungous infections
 - Inhalants (pneumoconioses)
 - Silicosis
 - Baritosis
 - Siderosis
 - Sarcoidosis
 - Infestations—amebiasis
- II. *Anatomic: Tracheobronchial*
Physiologic: Altered pulmonary volumes; impaired ventilation (rate and distribution)
Etiologic:
 - Postbronchitis—bronchiolitis (same causes as postinfectious above)
 - Asthmatoid (nonspecific—multiple aggravating factors)
 - Bronchiectasis—postinfectious
 - Chronic fibrocystic disease (pancreas, liver)
 - Kartagener's syndrome
 - Pneumoconioses
 - Byssinosis
 - Bagassosis
 - Thermal injury
- III. *Anatomic: Interstitial (alveolar wall)*
Physiology: Reduced pulmonary volumes; hypoxia; hyperventilation
Etiologic:
 - Postinfectious
 - Viral—exanthems, primary atypical pneumonia
 - Rickettsial—scrub typhus, Q fever
 - Chemical
 - Beryllium
 - Hexamethonium (rare)
 - Apresoline (rare)
 - Radiation
 - Collagen diseases
 - Scleroderma
 - Dermatomyositis
 - Lipoidoses—(Hand-Schüller-Christian disease)
 - Tuberous sclerosis
 - Hamman-Rich syndrome
 - Congenital alveolar dysplasia
- IV. *Anatomic: Vascular*
Physiologic: Altered perfusion; pulmonary hypertension
Etiologic:
 - Infarction
 - Emboli
 - Thrombi
 - Vasculitis and perivasculitis
 - Collagenous—periarteritis nodosa, lupus erythematosus
 - "Lymphogenous" spread of carcinoma
 - Hemosiderosis
 - Microscopic emboli without infarction
 - Schistosomiasis
 - Allantoic (post partum)
 - Fat particles

ciency. Regardless of origin, when fibrosis remains focal and leaves intervening zones of normal lung, over-all pulmonary function may be only minimally disturbed, depending on the remaining pulmonary reserve.

primarily produces vascular obstruction, but diffusion also may be decreased by the thickening of the alveolocapillary barrier. Considerable difficulty in anatomicophysiologic correlation also results from the multiple potential localizations of

many individual pulmonary diseases. Thus, classic Boeck's sarcoid produces extensive parenchymal nodular disease, often with minimal physiologic impairment; however, involvement of bronchial walls may occur, disturbing ventilation and producing disabling emphysema. Similarly, in some cases of Boeck's sarcoid, diffuse granulomatosis of the alveolar walls results in alveolocapillary block.

Correlative Classification

Since many of the etiologic agents that cause pulmonary fibrosis may lead to varied anatomic and physiologic abnormalities, a classification correlating etiology, pathology and physiology is fraught with duplication. Nevertheless, the clinical picture in any case is an integration of these factors. Thus, a correlative classification appears warranted as the basis of a systematic clinical approach to pulmonary fibrosis.

The works of two authors are notable. Spain³ classified pulmonary fibrosis anatomically as bronchial, interstitial, parenchymal, vascular and pleural. Describing the physiologic abnormalities of pulmonary fibrosis, Wright and Filley⁴ considered parenchymal, peribronchial and interstitial lesions. Borrowing generously from these authors, we shall consider parenchymal, tracheo-bronchial, interstitial and vascular pulmonary fibrosis, as well as the resultant abnormal physiology and the more common causes of each (Table II).

Parenchymal Fibrosis

Parenchymal fibrotic pulmonary lesions, whether single or multiple, regional or multifocal, involve portions of the pulmonary parenchyma but leave intervening zones of normal lung. All the healed necrotizing pneumonias are to be considered in this category. Also, those granulomas or diseases with formation of nodules that encroach on the surrounding parenchyma produce a similar distribution of pathologic changes.

Roentgenologic study reveals these lesions as isolated regional disease, such as the fibrosis secondary to healed bacterial or tuberculous pneumonia or the more diffuse nodular pattern of Boeck's sarcoid or nodular silicosis. The parenchymal lesions may manifest little or no physiologic impairment. Between the diseased portions are zones of relatively normal lung, and the vascular perfusion of the diseased tissue is minimal.⁴ The anatomic basis for the shunting of blood away

from these fibrotic regions is varied and includes such changes as fibrotic or thrombotic occlusion of the vessels in the involved zones or the vasoconstricting effect of hypoxia in the locally involved and underventilated portions of the lungs. Thus, both ventilation and perfusion may be reduced or absent in the involved parts. The functional result is similar to that of pulmonary resection. It is well known that patients who have had multiple lobectomies or pneumonectomy may carry on well if the remaining parenchyma is normal.

Results of Pulmonary Function Tests.—The pulmonary volumes,⁵ including vital capacity, inspiratory capacity, functional residual capacity⁶ and total capacity, usually are decreased to a similar degree, leaving the ratio of residual volume to total capacity less than 35 per cent. The maximal breathing capacity, as a measure of maximal ventilatory effort, may remain at or near normal. The percentage of nitrogen in the lungs after the patient breathes pure oxygen for seven minutes is less than 2.5 per cent, indicating normal distribution of gases in the lungs. Arterial hypoxia is absent.

Occasionally, in the more generalized and yet focal fibrosis, with most of the pulmonary parenchyma remaining normal, the only abnormality found on testing pulmonary function may be resting hyperventilation. Since this occurs in the absence of ventilatory failure and arterial hypoxia, it has been attributed to fibrotic constriction around the sensory receptors of the Hering-Breuer reflex. As a result of hyperventilation, mild respiratory alkalosis occurs, with increase in the blood pH and decrease of the blood carbon dioxide tension and carbon dioxide-combining power.

When disease involves a region of one lung, the over-all function may be essentially normal yet bronchspirometric examination may show a wide difference in the performance between the two lungs. Normally, the right lung, being somewhat larger, accounts for about 55 per cent of the total pulmonary function.

Etiology.—Many etiologic entities may produce local, regional or diffuse focal disease with little resulting disability. The destruction of pulmonary tissue in tuberculosis is well known. In recent years, the similar potential of numerous fungi has been stressed. Similarly, the necrosis associated with Friedländer's, streptococcal or micrococcal pneumonia is familiar. Nonnecrotizing pneu-

monia, primarily pneumococcal, ordinarily heals without fibrosis. With altered intrinsic factors present, however, intra-alveolar and intrabronchiolar fibrosis may ensue. Gleichman and associates⁷ noted that twenty-two of fifty-two patients who had fibrosis associated with unresolved pneumonia gave evidence of decreased bronchial drainage caused by upper respiratory, peribronchial or endobronchial obstruction, or by impaired ciliary action secondary to malignant tumors, inflammation, foreign-body reaction, asthma, bronchitis or bronchiectasis. The nature of the intrinsic tubular disease determines the distribution of the resultant fibrosis. The diffuse bronchiolar obstruction of asthma is accompanied by diffuse bronchiolar fibrosis distal to the obstruction. Primary bronchogenic carcinoma may be accompanied by regional fibrosis of the occluded segment. Tularemia and plague, while primarily glandular infections, have a pneumonic phase with necrotizing pneumonia, giving a high mortality rate. With recovery, parenchymal fibrosis ensues. Amebic infestation of the lungs, although rare in this country, may be associated with parenchymal destruction. The lungs may be involved by way of the blood stream or by transdiaphragmatic extension from the liver.

Massive necrosis and fibrosis may result from localized exposure to large doses of radiant energy, either x-rays or radioactive isotopes.

Boeck's sarcoid is a nonnecrotizing granulomatous disease resembling tuberculosis that affects the entire body, with a predilection for lymphoid tissue. The lungs show hilar adenopathy, fibrosis and nodular granulomas originating in the perivascular and perilymphatic tissue or alveolar walls and encroaching on the surrounding parenchyma. While the lesion is not in itself fibrotic, it heals by scarring, the extent of which is proportional to the previous granulomatosis. Clinically and roentgenographically, sarcoidosis may exhibit surprising remissions and exacerbations. Reisner⁸ studied thirty-three cases of pulmonary sarcoid; the lesions regressed in a third, remained stationary in a third and progressed in a third.

Interstitial nodules may be found in some of the various types of pneumoconiosis. In any reaction to dust, the inhaled particle reaches the alveolus or bronchiole, where it is ingested by wandering phagocytes. Contained within the phagocyte, the particle traverses the lymphatic system centrally, finally reaching the hilar nodes.

The increase in dust-laden and pigment-laden phagocytes within the lymphatic system may give rise to roentgenographic abnormalities suggesting hilar adenopathy and increased bronchovascular markings that do not, however, imply fibrosis. Two types of pneumoconiosis, without fibrotic potential and in which focal collections of dust-laden cells within the lymphatic system produce pseudonodulation, may resemble silicosis. These are siderosis⁹ among arc welders and baritosis¹⁰ among barite miners or processors. Fibrosis and disability are absent in both conditions despite considerable roentgenographic changes.

In silicosis, after the dust has been distributed within the lymph nodes and interstitium, the phagocytes are destroyed, leaving necrotic foci with surrounding fibrosis that ultimately shrink to dense whorled collagenous nodules. This process occurs within the lymph nodes and in the peribronchial interstitium at the site of branching pulmonary vessels. Nodules may occur within the walls of the bronchi and consequently distort and obstruct them, leading to secondary obstructive emphysema. These nodules gradually may coalesce by means of atelectasis, juxtaposition or, more importantly, pyogenic or tuberculous infection to which the tissues are sensitized. Central cavitation owing to tuberculosis or ischemic necrosis may occur. In the syndrome of rapidly developing silicosis, thought to be related to overwhelming exposure, silica is not transported centrally to the lymph nodes but is deposited in the bronchial walls and peribronchiolar interstitium, resulting in diffuse interstitial fibrosis. The clinical picture of silicosis may be complicated by the admixture of other dusts that by themselves are not fibrogenic. Whereas anthracosilicosis or siderosilicosis may be associated with bronchopulmonary symptoms, it is usually the content of silica that induces fibrosis.

Asbestosis is a more diffuse process, with less nodulation. The fibrotic reaction is more typically bronchial and peribronchial, and its diffuseness may result in severe disability.

Tracheobronchial Fibrosis

Tracheobronchial fibrosis includes that occurring within or about the tracheobronchial tree as far distally as the smallest bronchioles.

Roentgenograms may show an increase in the bronchovascular markings caused by endobronchial disease with irregular surrounding zones of infiltration representing residual inflammation. If

this is not extensive and if other complications are absent, pulmonary disability may not occur.

If bronchial or bronchiolar fibrosis is complete or if bronchial drainage is inadequate because of rigidity of the wall and destruction of the ciliary epithelium, obstructive pneumonitis will occur distally, with further impairment of pulmonary function. The final result of this process is a contracted fibrotic pulmonary segment.

Bronchiolar fibrosis frequently is diffuse and, although complete obstruction does not occur, expiratory obstruction is present, leading to diffuse emphysema. Emphysema is known to be a frequent late complication of numerous inflammatory processes, notably tuberculosis and chronic non-specific bronchitis.

As a consequence of the bronchiolar obstruction, the peripheral lung may become overdistended, with pronouncedly uneven ventilation of the alveoli, producing first ventilatory failure and finally alveolorespiratory failure. Patients who have tracheobronchial fibrosis have repeated infections, cough and progressive dyspnea. There often is evidence of poor thoracic expansion, distant breath sounds, delayed expiration and sometimes even wheezing as respiration becomes rapid with exertion. Clubbing of the extremities occurs in some cases of diffuse fibrosis with emphysema. Polycythemia, when present, usually is associated with *cor pulmonale*.

Results of Pulmonary Function Tests.—With mild emphysema, ventilatory failure ensues without alveolorespiratory failure. The total pulmonary capacity is normal or slightly increased, with a reduced vital capacity. If fibrosis is predominant, the total capacity may be reduced. The ratio of residual volume to total capacity is increased. The maximal breathing capacity is decreased to a greater degree than is the vital capacity. There is spirographic evidence of slowing of expiration and trapping of air. The alveolar concentration of nitrogen after the patient breathes pure oxygen for seven minutes is greater than the normal upper limit of 2.5 per cent. The physiologic dead space in the lungs is increased by the increased ventilation of relatively poorly perfused alveoli, and the diffusing surface is reduced by the rupture and coalescence of alveoli.

As the disease advances, compensation no longer can be maintained and arterial hypoxia ensues with exercise, and ultimately at rest. Despite hy-

poxia, a normal arterial carbon dioxide tension is maintained for a time by hyperventilation of essentially normal alveoli. Still further in the progress of the disease, the compensatory excretion of carbon dioxide is no longer adequate and hypercapnia becomes evident.

Etiology.—Intrinsic endobronchial diseases such as chronic asthmatic bronchitis, chronic bronchitis, bronchiectasis, and bronchiolectasis may be associated with bronchial fibrosis and often with fibrosis of the distal pulmonary parenchyma. Chronic fibrocystic disease of the pancreas often is associated with bronchitis and bronchiectasis. Two of the pneumoconioses are characterized by an endobronchial reaction. The first is bagassosis, which is an acute illness resembling viral pneumonia following variable exposure to the inhalation of particles of dust from the waste of sugar cane, known as bagasse.¹¹ While this is usually a brief illness with complete recovery, it gives pathologic evidence of endobronchial fibrosis surrounding superficially embedded spicules of bagasse. The second is byssinosis, a disease of workers in the cotton industry developing after many years of exposure.¹² It is a form of chronic bronchitis, often complicated by emphysema, that occurs transiently after the first exposure only to recur later, gradually becoming irreversible. The exact mode of action is unknown, but a specific allergy has not been demonstrated. While the incidence of the disease among workers exposed to cotton dust indicates an etiologic relationship, only the nonspecific findings of chronic bronchitis and emphysema are present at necropsy. Other pneumoconioses, such as silicosis, are associated with endobronchial lesions complicated by severe emphysema. Thermal energy from fire has caused acute tracheobronchial burns with secondary fibrosis.

Interstitial Fibrosis

Interstitial fibrosis denotes lesions involving primarily the alveolar walls, although the fibrosis may extend into the finer airways in some cases. Alveolocapillary block is a syndrome in which there is an impediment to the diffusion of oxygen across the alveolocapillary barrier. Clinically, symptoms are often out of proportion to the roentgenographic findings. Exertional dyspnea, cough, weakness, fatigability and exertional cyanosis are prominent. Digital clubbing and polycythemia are sometimes present in more advanced disease.

Results of Pulmonary Function Tests.—These patients show no spirographic evidence of respiratory slowing or trapping of air. They have normal or small residual volumes, and the ratio of the residual volume to the total capacity usually is normal. The alveolar concentration of nitrogen after the patient breathes 100 per cent oxygen for seven minutes is less than 2.5 per cent. The arterial oxygen saturation is less than normal at rest, decreases sharply with slight exercise and increases to normal when the patient breathes 100 per cent oxygen. The arterial carbon dioxide tension is normal or even low, since these patients tend to hyperventilate both at rest and with exercise.

Etiology.—Acute viral pneumonias are characterized by an acute alveolar, septal and peribronchial reaction. Influenza, measles, primary atypical pneumonia, scrub typhus and psittacosis have been described as showing edema, thickening and mononuclear infiltration of the alveolar wall. Similar involvement of the bronchial wall is noted with variable degrees of intrabronchiolar exudate. Mononuclear alveolar exudates or a hyaline membrane may be present. While many observers consider these lesions to be the precursors of interstitial fibrosis, the evidence remains scanty.

Berylliosis, in the acute phase, is capable of producing a boggy lung with intra-alveolar mononuclear exudation and interstitial edema.¹³ Chronic exposure may produce a fibrotic reaction. Chronic beryllium granulomatosis exhibits fibrinoid granular central necrosis surrounded by fibroblasts, lymphocytes, plasma cells, giant cells and conchoidal bodies.

Eight patients treated with hexamethonium, alone or in combination with hydralazine (apresoline) hydrochloride, had interstitial fibrosis that was indistinguishable pathologically from the Hamman-Rich syndrome.^{14,15}

Following exposure to radiation, acute swelling and necrosis occur in the alveolar epithelium and capillary endothelium. With a sufficient dose, edema of the alveolar walls and formation of an intra-alveolar hyaline membrane are seen. The injury heals by scarring.

Scleroderma produces alveolar and peribronchiolar fibrosis resembling the changes seen in the skin and other organs. Vascular thickening and emphysematous changes have been reported. The lacelike honeycombed appearance of the lower two

thirds of the lung fields caused by fibrosis of the alveolar walls and cystic emphysema are said by Pugh¹⁶ to be distinctive. Other workers, however, consider that the roentgenographic changes are not diagnostic.

The lipoidoses, particularly eosinophilic granuloma and Hand-Schüller-Christian disease, may induce alveolar and peribronchiolar reactions, consisting of xanthogranulomas containing dense histiocytic centers surrounded by eosinophils and fibroblasts. In addition to septal fibrosis, cystic emphysema often occurs secondary to involvement of bronchiolar walls. The roentgenographic appearance has suggested the term "honeycombed lung."

Tuberous sclerosis has been reported as a cause of "honeycombed lung"; necropsy may reveal bullae of various sizes surrounded by septa as much as 1 cm. in thickness containing vessels, small bronchi and smooth-muscle tissue.

Congenital alveolar dysplasia of the lungs is a form of fetal arrest with immature alveoli having thick septa. Interlobular walls are prominent and consist of immature connective tissue. While signs of inflammation are absent, some authors attribute the condition to intra-uterine infection. The milder forms are considered compatible with life and may appear as interstitial fibrosis.

Hamman and Rich¹⁷ described an idiopathic form of interstitial fibrosis characterized by (1) inflammation with edema and but few leukocytes, unlike the ordinary pneumonias, (2) cuboidal appearance of the alveolar epithelium, (3) necrosis of alveolar and bronchiolar epithelium, (4) presence of hyaline membranes, (5) edema and fibrin in the alveolar wall, (6) extensive diffuse progressive interstitial fibrous proliferation, (7) eosinophils in the interstitium and (8) absence of stainable bacteria. Numerous case reports of this syndrome have appeared subsequently, stressing or deleting some of the original criteria but emphasizing a pronounced interstitial fibrous reaction as the predominant pathologic change. While the disease in the originally reported cases was rapidly fatal, some subsequent patients have lived as long as nine years.¹⁸⁻²⁰ Although the cause is still unknown, most speculation implicates a preceding interstitial pneumonia. A familial incidence is evident. The response to steroids has been variable, and only a few patients with predominantly inflammatory lesions have benefited, only to have

exacerbations despite continued treatment or on withdrawal of the medication.

Vascular Fibrosis

A number of clinical entities are associated with pulmonary fibrosis originating in the vasculature. Secondary fibrosis of other structures may occur but circulatory abnormalities usually predominate. Increase of the pulmonary arterial pressure with subsequent failure of the right ventricle, end-diastolic right ventricular hypertension and, finally, peripheral edema, ascites and hepatomegaly may occur as a result of the various types of fibrosis or pulmonary emphysema. In these instances, the pulmonary hypertension follows obliteration of the vascular bed by fibrosis of surrounding structures, rupture of capillaries and vasoconstriction secondary to hypoxia. With primarily vascular fibrosis, actual cicatrization occurs about the pulmonary arterioles, with restriction of much of the vascular bed.

Etiology.—Pulmonary infarction and resulting fibrosis may be produced by pulmonary embolism, multiple emboli in the "main-line" drug addict, periarteritis nodosa and the thrombotic occlusion of polycythemia vera and sickle cell anemia.

Emboli small enough to be limited to the arterioles do not cause infarction but rather produce an inflammatory endarteriolitis. Fat and alantoic embolization and schistosomiasis, with microscopic emboli, are examples of conditions that produce perivascular interstitial fibrosis. Lymphogenous metastatic carcinoma, producing variable degrees of "perilymphatic" fibrosis, actually may represent minute pulmonary arteriolar emboli of malignant tissue.

Pulmonary vascular intimal proliferation may result from long-standing increases in the pulmonary blood flow secondary to intracardiac shunts. The "back pressure" in the pulmonary vascular system with left ventricular failure or with mitral stenosis induces chronic fibrous thickening of the vessels, as well as nodular collections of hemosiderin-laden phagocytes in the perivascular interstitium. In periarteritis nodosa, the nodular inflammatory and fibrous thickening of the vessel walls produces perivascular fibrosis, as well as distal infarction. Similarly, chronic perivascular fibrosis occurs in long-standing ascariasis after the insult of repeated larval migration.

The pulmonary manifestations of the "collagen diseases" are worthy of mention. Periarteritis

nodosa and scleroderma have been referred to. Disseminated lupus erythematosus may produce pleurisy and pneumonia associated with atelectasis, but evidence as to ultimate fibrosis is lacking. Many pulmonary complications of rheumatoid arthritis have been described but none with a specific rheumatoid lesion. Conversely, a rheumatoid syndrome is a common complication of many pulmonary diseases, such as tumors, particularly mesotheliomas, interstitial fibrosis and the progressive massive fibrosis of advanced silicosis.

The eosinophilic infiltration of Löffler's syndrome, and the lesions of Wegener's granulomatosis²¹ and all the variants of interstitial granuloma with angiitis, such as respiratory-renal polyarteritis nodosa, rheumatic vascular inflammation, paraneuritic disorder and allergic granulomatosis, are thought to be manifestations of a hypersensitivity reaction that may be classified under the heading of pathergic granulomatosis.²² Variable degrees of perivascular pulmonary fibrosis may occur in the more persistent of these syndromes.

Comment and Summary

Pulmonary fibrosis is the formation of scar tissue in the lungs of sufficient degree to be characterized clinically by abnormal roentgenographic shadows or physiologic impairment or both. It is distinguished from the diffuse pulmonary diseases that also include edema, exudation and inflammation. Fibrosis is suggested clinically by the prolonged duration of physiologic or roentgenographic abnormalities, but a definitive diagnosis must be supported by histologic proof.

Pulmonary fibrosis has been classified into four pathophysiologic groups. Parenchymal lesions, the first group, are focal in distribution and leave zones of relatively normal intervening lung. These lesions usually result in symmetrically decreased lung volumes and hyperventilation, but otherwise the pulmonary function is normal. In general, the roentgenographic abnormalities exceed the physiologic and clinical evidence of disease. Pyogenic, tuberculous and mycotic infections, silicosis and sarcoidosis are the main causes of parenchymal pulmonary fibrosis.

The second group, namely tracheobronchial lesions, result in focal or diffuse narrowing of the airways, producing distal atelectasis or emphysema. The increased work of ventilation is reflected in slowing of expiration and decrease in maximal

breathing capacity. There are increases in the ratio of residual volume to total capacity and in the index of intrapulmonary mixing of gases. Alveolorespiratory failure, with arterial hypoxia, and finally hypercapnia ensue. Chronic bronchitis, bronchiectasis and some pneumoconioses are the main causes of tracheobronchial lesions.

Interstitial fibrosis, the third group, is manifested by involvement of the alveolar walls, resulting in a diminution of gaseous exchange. Significant hypoxia and symmetrically decreased lung volumes are the main abnormalities. Viral and rickettsial pneumonias, berylliosis, radiation pneumonitis, scleroderma and the Hamman-Rich syndrome are the common causes of interstitial fibrosis.

Vascular fibrosis, the final group, results from emboli, thrombi and many of the collagen diseases and may lead to failure of the right side of the heart.

The clinical problem of pulmonary fibrosis involves etiology and prognosis. The clinician's first duty is to exclude contagious infections and malignant tumors. Smears, cultures and cytologic examination of sputum, cultures of gastric washings, skin tests and a general examination often determine the specific cause. Asymptomatic, nonprogressive fibrosis that is neither infectious nor malignant need give no further concern. Symptoms of pulmonary insufficiency or evidence of roentgenographic progression, however, demands additional study.

A careful history and physical examination may disclose a previous infection, an occupational exposure or a generalized disease of which pulmonary fibrosis is only one manifestation. In many instances, however, a specific etiologic diagnosis cannot be made. Biopsy of the scalene lymph nodes or the lung may help uncover the cause of obscure fibrosis. While not always definitive, histologic evaluation, when coupled with estimates of physiologic impairment and clinical progression, usually permits a reasonably accurate prognosis.

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Continuation Studies

Some Electrocardiographic Tests of Coronary Insufficiency

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IT IS OFTEN important and extremely difficult to determine whether angina pectoris exists, or whether a patient's discomfort is caused by one of about two dozen other entities that may mimic it. As a rule the patient's history and response to nitroglycerine are most helpful, but in atypical cases or in cases without any pain, other diagnostic methods are required. A twelve lead resting electrocardiogram is often perfectly normal in the presence of severe coronary sclerosis. However, certain electrocardiographic changes are often transiently present during episodes of angina pectoris. These abnormalities consist of ST segment depressions and the tendency to inversion of T waves in leads facing the left ventricle. This is the pattern of subendocardial ischemia. Due to its anatomical placement at the end of the line, it is the subendocardium that suffers first when the oxygen supply is deficient.

Numerous investigators have attempted to take advantage of this fact by devising tests by which the electrocardiographic response to stresses of various kinds is recorded. Two main types of such tests will be described, the first one briefly.

The hypoxia test devised by Levy consists of inducing the resting patient to breathe a mixture containing 10 per cent oxygen. An electrocardiogram is made before the test at basal conditions, and after breathing 10 per cent oxygen for five, ten, and twenty minutes. The test is terminated if chest pain occurs, and the patient can be given inhalations of 100 per cent oxygen if necessary. The popularity of the hypoxia test has waned recently because the various exercise tests appear to be more reliable and somewhat less dangerous. Pulmonary edema, peripheral vascular collapse, and generalized convulsions have been precipitated by the test.

The following are considered to indicate an abnormal Levy test:

1. ST depression totaling 3 mm. or more in leads I, II, III and CF_4 ,
2. inversion of T_1 or TCF_4 , or
3. partial inversion of T_1 or TCF_4 , provided the lead in question displays at least 1 mm. ST depression.

Other investigators have devised exercise tests of many types, including such exercises as running up two flights of stairs, stooping, stair climbing, bending, et cetera. Some men attempt to fit the exercise to the activity that usually precipitates the patient's pain.

Perhaps, the best known of the exercise tests is the two-step test devised by Dr. Arthur Master. The test consists of having the patient make a predetermined number of trips over two nine-inch high steps in ninety seconds. The number of trips is read from tables, and depends upon age, sex, and weight. A resting 12 lead cardiogram is taken just before the test and is read. Unless this tracing is normal, the test is cancelled. The lead cord is then disconnected from the machine and carried by the patient as he walks over the steps, electrodes in place on his extremities. After completing the exercise, he lies down and a few beats of leads II, V_4 , V_5 , V_6 are recorded as quickly as possible. Haste is important here as evanescent abnormalities often occur that may otherwise be missed. Only enough complexes must be taken to produce a level base line in each lead. The four leads are again taken at two and six minutes post exercise. If the test is considered normal, a double Master test is done at least an hour later. In the double test, twice the number of trips are made in twice the time, i.e., three minutes. Master states that a negative double two-step test *practically* excludes significant coronary disease.

Master's criteria for abnormality differ from Levy's and are essentially:

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1. ST depression of 0.5 or more mm. in any lead.
2. T wave inversion in any lead.
3. Production of blocks or of various arrhythmias.
4. Miscellaneous poorly understood changes such as ST elevation or perhaps paradoxical behavior of T waves, i.e., a negative T becoming upright.

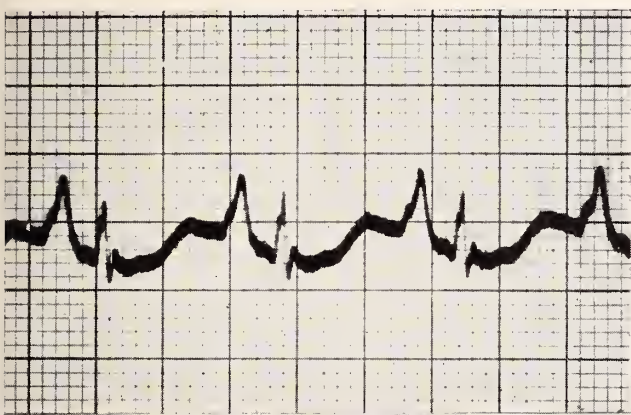


Fig. 1. Lead 2 from a case of chronic pulmonary hypertension, showing huge peaked P waves. Atrial T waves can be seen as inverted smooth waves beginning .05 to .06 seconds before the peak of the R wave and terminating .12 seconds after the peak of the R. These atrial T waves are larger and more easily identifiable than those usually seen because the size of the atrial T wave is proportional to the size of the P wave.

Changes are normally seen after exercise and involve all of the electrocardiographic deflections:

1. The P wave becomes higher, and right axis deviation of the P wave occurs.
2. The P_T wave increases in size.
3. The PR interval shortens.
4. The PR segment becomes depressed.
5. The QRS duration decreases.
6. The ST segment becomes depressed.
7. The T wave becomes lower, then higher, and then lower.
8. The QT interval and the U wave show variable changes. Usually the U wave becomes higher.

Most of these changes are so slight that they are not detected without special measuring devices. ST depressions and T wave lowerings, however, are often of considerable magnitude following exercise. Inasmuch as ST and T changes are also seen in spontaneous angina pectoris and as a result of the test in question, assigning the correct etiology to observed changes can be very difficult.

The following factors may make measurement of ST depression difficult or impossible:

1. Due to tachycardia, the P wave may occur on the descending limb of the preceding T wave. This causes the most logical isoelectric line, the T-P segment, to disappear.
2. A U wave may become elevated, obliterating the T-P segment; therefore the level of the PR

segment should be taken as the base line.

3. The PR and ST segments may become depressed because of increased voltage of the auricular T wave, which is negative.

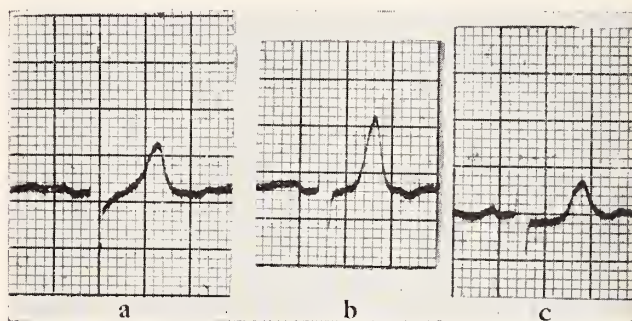


Fig. 2. (a) resting; (b) immediately after exercise; (c) two minutes later. Positive test showing inverted U wave immediately after exercise. (The ST segment at rest is not strictly normal). Exercise tolerance tests are usually not performed in such cases.

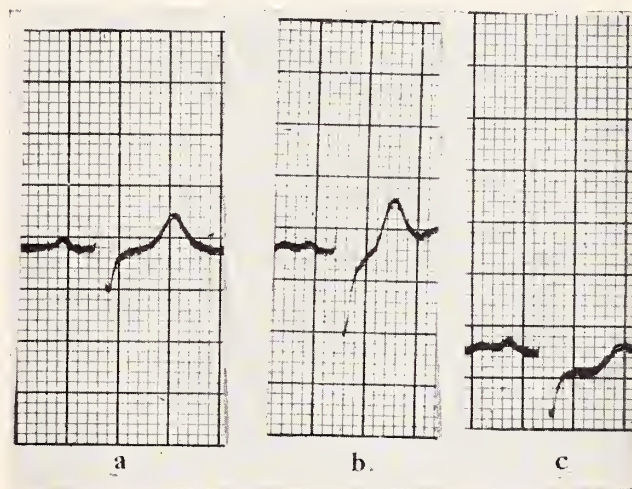


Fig. 3. (a) resting; (b) immediately after exercise; (c) two minutes later. Positive Master Test showing more marked abnormality at two minutes than immediately after exercise.

Most authors consider Master's criteria to be too strict and consider ST depressions of up to 1.5 or 2 mm. as normal or borderline. Production of a negative U wave should also be considered abnormal.

It stands to reason that if one calls very minor ST depressions abnormal, he will err on the side of having relatively many false positives; conversely, if one requires considerable ST deviation, his mistakes will be predominately false negatives.

Dr. Gordon Myers has approached the problem somewhat differently and places emphasis on the contour of the ST segment. He feels that an ST segment that is concave superiorly and runs

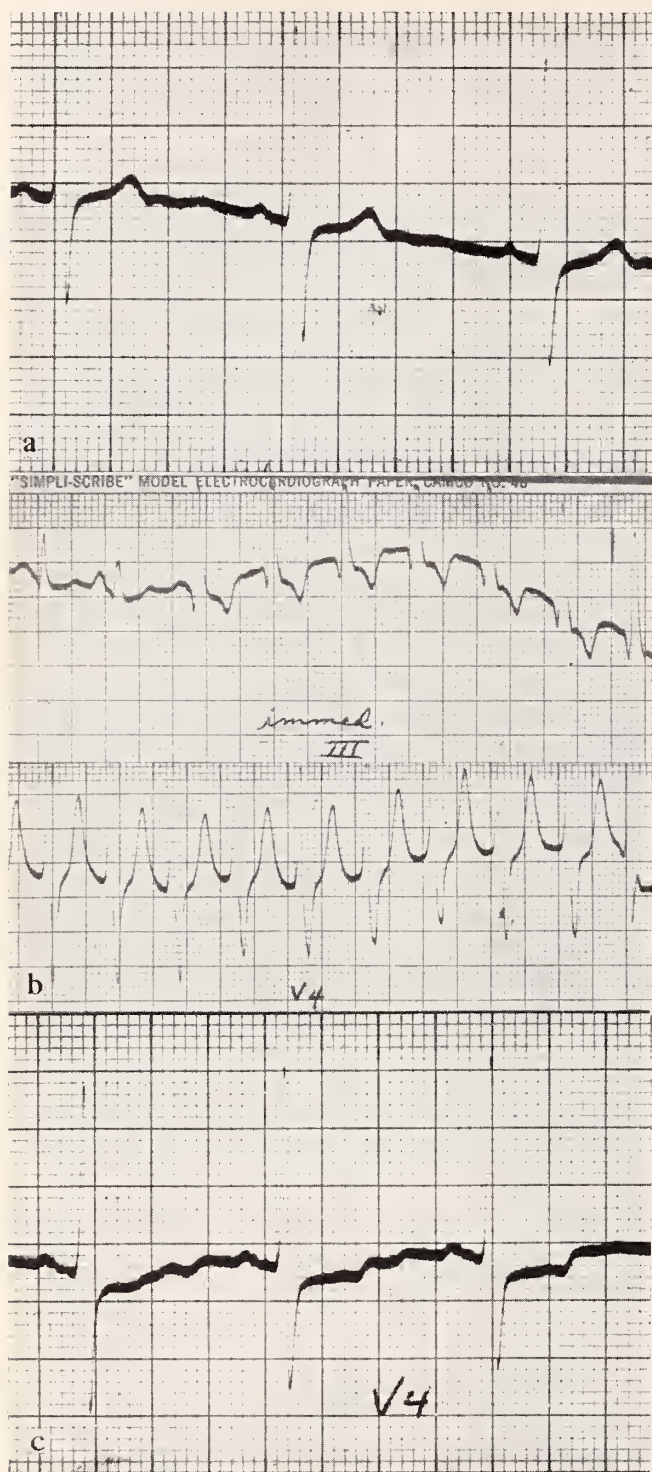


Fig. 4. Master test showing positive result including episode of ectopic rhythm, probably ventricular tachycardia. (a) Lead V_4 resting. (b) Immediately after exercise. The third complex of lead 3 inaugurates a burst of ventricular tachycardia. V_4 is shown for comparison with the previous and subsequent strips. (c) Lead V_4 , two minutes after exercise. Sinus rhythm has returned, but ST and T waves are abnormal.

smoothly into the ascending limb of the T wave is likely to be normal, and that an ST segment that is horizontal or slopes slightly downward is probably abnormal.

A further source of confusion is evident in that Dr. Master states that a positive test may mean either organic or functional coronary insufficiency. It would seem almost as difficult to separate organic from functional coronary insufficiency in the positive Master test as to separate the pain of coronary insufficiency from the pain caused by various noncoronary entities.

Dr. Master has used the adrenolytic drug dihydroergocornine to accomplish this. He reports positive two-step tests which are repeated following administration of hydrogenated ergot derivatives. In certain cases the test then becomes negative. These cases are called instances of functional coronary insufficiency.

In conclusion, the most widely accepted electrocardiographic test for coronary insufficiency is the Master two-step test. It has the advantages of simplicity, safety, and standardization. It can be used to evaluate coronary vasodilator drugs. In common with most similar tests, it does not prognosticate.

The amount of stress applied depends only on age, sex, and weight, whereas many investigators feel that one cannot justifiably ignore the degree of coronary narrowing present in a given patient. They also consider that the oxygen requirement is proportional to the work of the heart, and depends upon the patient's emotional reaction, the condition of his autonomic nervous system, and his degree of physical training.

Technically, the measurement of post-exercise changes is often difficult, and the evaluation of these changes once they are measured is equally perplexing. It is often in the most difficult cases clinically that one will encounter a false positive or a false negative result. In addition, the separation of positives caused by organic narrowing from those caused by functional insufficiency needs further study.

The Master test, then, is often helpful and too often disappointing. It is of greatest value when it supports the clinical impression and adds weight to a previously established diagnosis.

One should, however, be somewhat hesitant to accept a Master test that contradicts a well formed clinical impression.

Acknowledgment

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Injuries of the External Genitalia

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THE GENITALIA, because of location and mobility, are seldom injured. To the injured, molehill damage may assume mountainous proportions and sometimes the main problem is psychic.

Skin

The rotating shaft with set screw is a hazard to boys and adults. The individual steps over the unguarded power take off and the set screw catches the overalls removing them and the skin of the penis and scrotum, usually leaving the preputial mucosa and a few tags of scrotum, but not otherwise injuring the testes or penis. Cleansing and hemostasis are performed, and skin graft from a rather hairless area to the penis is necessary as a rule. The testes may be covered with freed thigh skin and scrotal tags. All scrotal skin should be saved because the scrotum has remarkable healing and regenerative powers.

Constricting injury to the penis is not uncommon. The constricting mechanism is applied, and soon edema prevents removal. Dr. Richardson removed a Timken bearing with the aid of general anesthesia, water cooling, multiple dental carborundum discs, and patience.

Bites may cause great edema, and at times, infection. Despite massive edema, urination is usually uneventful. The outdoor facilities in the south frequently harbor the black widow spider. In case of a spider bite cold applications may be warranted to delay absorption if the situation is recognized early enough.

Lacerating injuries, common in war, are usually caused by land mines, booby traps and shell fragments. The automobile, irate husbands and wives, and playful companions are the most common offenders in civil life where cutaneous destruction is seldom serious.

Penis

The penis is sometimes amputated by the insane or irate, and blood loss may be fatal. If severance is partial, attempt at salvage is often

successful. Debridement and suture of the fascia of the corpora with catheter splinting of the urethra and pressure dressing using mechanics waste is done. Penetrating and lacerating wounds involving the penis itself are similarly treated.

Fracture of the penis is an uncommon but arresting injury. History of the mechanism is frequently vague, and delay in seeking help is common. The one requisite is erection. An audible snap or pop is usually reported. Pain, swelling, and hematoma are prompt, and the penis is no longer erect but is deviated to the side opposite the fracture. Deviation increases as the hematoma enlarges. Recognition is usually easy if the hematoma is not too large. Pressure bandaging, with indwelling catheter, suffices if the hematoma is not large. Frequently hemorrhage is massive in which event evacuation of clot and suturing of Buck's fascia is done. Impotence appears to be a common sequela, as with many genital injuries.

Urethra

The bulbous and pendulous urethra may be damaged by penetrating and lacerating wounds, chemicals, instrumentation, foreign bodies, and straddle injury.

In all penetrating-lacerating wounds of the genitals, perineum, and pelvic area, one should promptly ascertain the integrity of the urethra. If unrecognized, urethral injury may be the most serious damage inflicted. This is particularly true of the deep urethra. In the distal urethra the diagnosis is readily made and the mechanism is the same as penile injury. Since the advent of antibiotics in the treatment of gonorrhea, chemical trauma is rare, but when it occurs it results in severe stricture formation over long areas.

Urethral instrumentation should be gentle at all times. False passages compound the difficulty with strictures and severe strictures may be caused by instrumentation, usually the employment of a scope too large for the urethral caliber. Inlying catheters, especially in the paraplegic, may in-

jure the mucosa at the peno-scrotal angle by pressure with resulting abscess, fistula, or diverticulum formation; therefore, the inlying catheter, no larger than 18 Fr., should be brought over the thigh in the inguinal region. The presence of foreign bodies, hat or corsage pins, swizzle sticks, et cetera, is usually self evident, though history may not be given. Foreign bodies may be removed endoscopically or by external urethrotomy done in the bulb.

Straddle injuries are associated with the board fence, construction beams, and wagon boxes and tongues. The urethral bulb is impinged against the inferior aspect of the pubis. Meatal bleeding and perineal pain, swelling, and ecchymosis occur. The hematoma in injury of the bulb is confined by Colles' fascia and accordingly involves the perineum, scrotum, ischio-rectal fossae, penis, and lower abdominal wall. Minor injuries are sometimes catastrophic.

Patients suffering urethral trauma should be given prophylactic antibiotics. If the urine is previously infected, ensuing sepsis may be grave. Penetrating-lacerating wounds should be cleansed, debrided and repaired with fine catgut over an inlying catheter if loss of tissue is not too great. In the latter case, diversion of the urine is necessary and may be by catheter if the proximal urethra can be located, otherwise by cystostomy. The complications of instrumental trauma may be partially avoided by the use of a small inlying catheter for one to two days. The urethral catheter should never be so large as to preclude urethral drainage.

The treatment of straddle injury depends upon the extent of tissue damage. The patient should be cautioned against trying to void. Frequently a catheter can be passed gently and left indwelling for three or four days, and this maneuver should be tried. Large hematomas should be drained in the perineum, not in the scrotum where the swelling may be greatest. The individual suffering straddle injury seldom has shock and complicating fractures, so he may usually be placed in the lithotomy position. If the contusion is marked, high suprapubic cystostomy is advisable, preferably splinting the urethra. This may be accomplished by passing a sound downward through the cystostomy and another upward through the distal urethra. When they are felt to click, the penile sound follows the other by clicking con-

tact, and the tip is protruded through the cystostomy wound. A catheter is tightly fitted over the tip of the sound and withdrawn through the urethra. Usually it is preferable to sew to this catheter a Foley catheter, 18-20 Fr., which may be drawn into the bladder and left indwelling for eight to ten days. Drainage of the perineal hematoma is advisable. In lesser injury, the perineum may be explored and catheter passage and repair attempted under vision; however, the infiltration of the loose tissues with blood makes recognition of the proximal end of the urethra difficult. In all injuries to the urethra, the adequate care of the resulting stricture is of the utmost importance.

Scrotal Contents

The scrotal contents are sometimes damaged in surgery, particularly in hernioplasty when the vas or testicular blood supply may be disrupted. Penetrating-lacerating injuries are most common in war, vehicle accidents, and attempts at emasculation. The arterial supply to the testis enters the hilum, then branches and runs in the inner layer of the tunica albuginea to the "anti-mesenteric" area where it then penetrates the parenchyma. Testis wounds should be debrided and any tissue with potential viability conserved, closing the tunica albuginea. This is most important when the trauma is bilateral. Freshened ends of the vas can be approximated by fine silk sutures after splinting the defect with a nonabsorbable suture brought out through the vas wall proximally and distally and then brought through the skin for removal in a week.

Hematocele is an accumulation of blood within the tunica vaginalis and is usually very painful due to pressure. It may occur with or without rupture of the tunica albuginea and may be rather slow in developing. The mass does not transilluminate. Aspiration may be successful since the blood may remain liquid in slowly forming hematoceles, but evacuation of clots and hemostasis are preferable if the condition can be separated from scrotal hematoma. In the latter, pain is less and the scrotum feels less weighty. A chronic organized hematocele is most difficult to differentiate from testicular tumor.

So-called "traumatic epididymitis" is of considerable industrial importance. There are opinions

(Continued on Page 517)

Case Presentations

Roentgen Findings in Leiomyosarcoma of the Pancreas

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LEIOMYOSARCOMAS are not unusual in tissues in which smooth muscle predominates, but they are quite unusual in the pancreas. As it may be of importance to include this entity in the differential diagnosis of pancreatic masses, we feel it is warranted to report a case.

Ross¹ has reported the pathologic findings of a single case of leiomyosarcoma of the pancreas in an aged diabetic male who had widespread metastases, including skin nodules. No roentgen examinations were done. Weintraub and Tuggle² briefly mentioned leiomyosarcoma of the pancreas as one of the twenty cases of neoplasm involving the duodenum.

The paucity of reports of the literature indicates that the condition is quite rare. This is a tumor of low grade malignancy. Consideration of this entity in the differential diagnosis may be of practical value. Observation to follow enlargement of a possible "pancreatic cyst" is obviously not the treatment of choice.

Case Report

E. F. is a fourteen-year-old white boy who was admitted to his local hospital after a two-week history of dull epigastric pain and nausea. He had a bout of jaundice and light stools with subsequent spontaneous remission of his jaundice. His preoperative hemoglobin was 7 Gm. At surgery, a hard pancreatic mass was found and he was transferred to the University of Minnesota Hospitals. On admission the only finding was that of an obvious epigastric mass. No icterus was apparent. Laboratory findings were as follows: Sedimentation rate 8.5 mm/hr, hemoglobin 16.1 Gm., serum albumin 2.1 grams per cent, serum globulin 6.4 grams per cent, alkaline phosphatase 19.9 K.A.U., total serum bilirubin 0.5 mgm per cent, and glucose 80 mgm per cent. The radiographic findings were those of a well circumscribed rounded mass in the head of the pancreas. As such it displaced and widened the duodenal loop. The second portion of the duodenum was pushed laterally and anteriorly. The ligament of Treitz being to the left of the lesion was not displaced. There was

anterior and left lateral displacement of the gastric antrum.

Since adenocarcinoma of the head of the pancreas does not occur in this age group, the tentative preoperative radiologic diagnosis was that of a cyst of the head of the pancreas, a cystadenoma of the head of the pancreas, a rare tumor that occurs in childhood,³ or a retroperitoneal sarcoma invading the pancreatic bed.

The value of this case from a roentgen standpoint is the inclusion of this rare tumor in the differential diagnosis of lesions of the head of the pancreas.^{2,3} It is to be kept in mind, however, that the lesion elsewhere in the pancreas could produce several different configurations. According to Case,⁴ they could fall into gastrophilic, gastroduodenal, gastrosplenic, and mesocolic types.

Figure 1 shows extrinsic compression of the right kidney and considerable displacement to the right of the duodenal bulb.

Figure 2 demonstrates the posterior mass flattening and displacing the second portion of the duodenum anteriorly. This in itself pinpoints the mass, since the second portion of the duodenum is a retroperitoneal structure whose mesentery has been resorbed and only the parietal peritoneum covers the anterior surface of the duodenum.

Figure 3 shows a more familiar appearance and is classic for a lesion of the head of the pancreas: widening of the duodenal loop and anterolateral displacement of the antrum.

Dr. Bernard Zimmerman performed a laparotomy and found a large round encapsulated tumor to the left of the duodenum in the head of the pancreas. It extended to the left of the superior mesenteric vessels. There was only a small segment of normal pancreas. A radical pancreato-duodenotomy, Whipple type, was done. His recovery was uneventful. The surgical specimen consisted of the head of the pancreas and duodenum, with attached portions of common bile duct, stomach and jejunum. There was a large rounded tumor measuring 11 x 10 x 9 cm. in the head of the pancreas. This was sharply circumscribed. Compressed pancreatic tissue lay over the tumor. The walls of the duodenum, common bile duct, and major pancreatic duct were completely independent of the tumor. The major pancreatic duct was small and displaced posteriorly. On the cut surface, the tumor was greyish-white in color, fibrous in character, and firm in consistency. In the center was an area of cystic necrosis about 3 cm. in diameter. The microscopic sections of the tumor showed it to be composed of intertwining fasciculi of spindle-shaped cells and

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Fig. 1. An anterior-posterior film of an excretory pyelogram shows extrinsic compression of the right kidney without displacement, superimposed mass margins (arrows), and displacement of the duodenal bulb to the right (arrows).



Fig. 2. Lateral view of an upper gastrointestinal series. The duodenojejunal juncture (arrows) is not displaced, but the pars media of the stomach is effaced and anteriorly displaced.

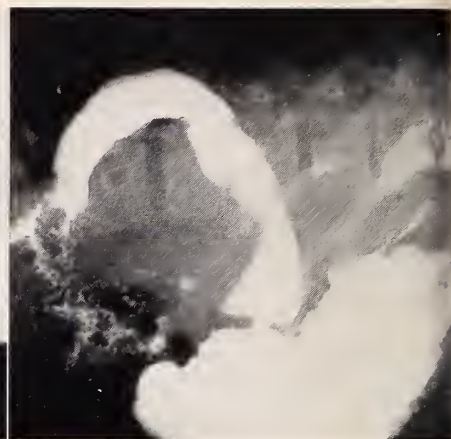


Fig. 3. An oblique view of the stomach and duodenum shows marked widening and stretching of the second portion of the duodenum.

fibers. There was a moderate amount of cytoplasm which was elongated, strap-like and eosinophilic, resembling smooth muscle. The nuclei were oval or spindle-shaped and occasionally showed blunt ends. Some of these showed variation in size and there were occasional mitotic figures. Some nuclei were large and rounded, with prominent nucleoli. The tumor in some areas had a loose structure while elsewhere it was more densely cellular. Multiple sections showed no other elements in the tumor. It was only moderately vascular. These seemed to be a thin capsule about the tumor of compressed fibrous tissue, containing some pancreatic acini and islets of Langerhans. The tumor appeared to be independent of the muscular walls of the duodenum and common bile duct and separated from them by its capsule and loose areolar tissue.

This is believed to be a smooth muscle tumor which is considered malignant because of pleomorphism of the cells and evidence of growth activity. It appears to be of a low grade of malignancy, however, and there is no present evidence of spread beyond the primary location. Dissection does not reveal any gross structure of origin. The origin of this tumor is obscure but might be from the smaller pancreatic ducts or from vessel wall.

Conclusion

A case of leiomyosarcoma of the pancreas in a fourteen-year-old boy is presented with particular attention to the roentgen and pathologic findings.

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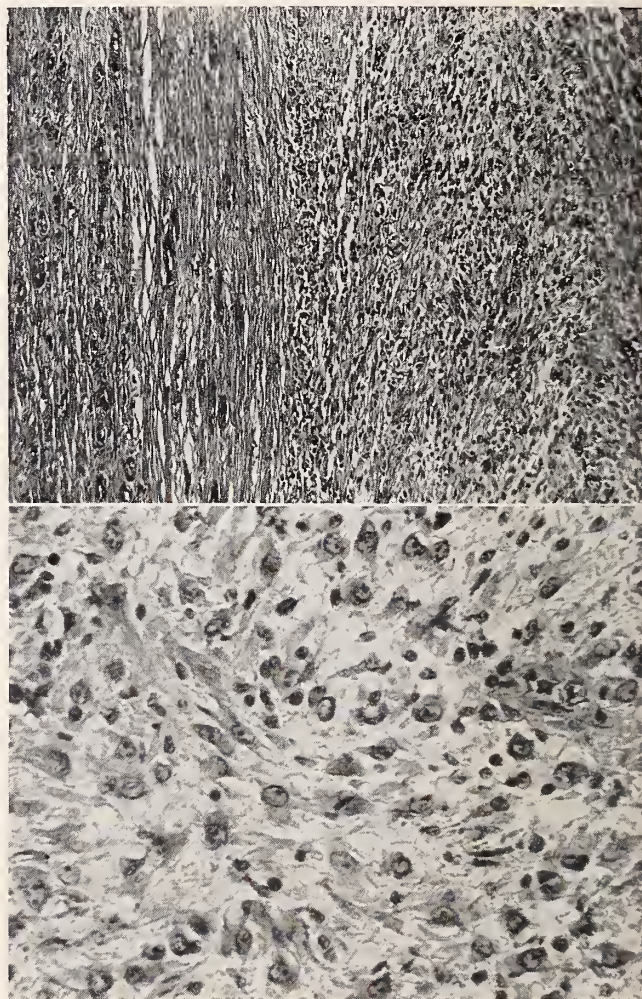


Fig. 4 (above) Photomicrograph of a section taken from the margin of the tumor. There is compressed pancreatic tissue in the fibrous capsule. The tumor is composed of intertwining bundles of spindle-shaped cells. Hematoxylin and eosin stain, 60X. Fig. 4 (below) Photomicrograph of the tumor under higher magnification. Nuclei in some areas are plump and somewhat irregular in size, with occasional mitoses. The cytoplasm is generally strap-like and deeply eosinophilic. Hematoxylin and eosin stain, 250X.

Case Studies, Minneapolis Veterans Hospital

Edited by
CLAUDE HITCHCOCK, M.D.

MESOTHELIOMA

Case 1.—This young man first entered the Minneapolis Veterans Hospital during 1952 at the age of twenty-seven. He complained of a dull, crampy abdominal pain and abdominal distention gradually increasing for the previous two to three months. Examinations of liver and kidney functions at this time were within normal limits and upper gastrointestinal x-rays and barium enema x-ray examinations were also normal. A bone marrow biopsy was performed and was found to be normal.

The past history of this patient was of interest. For fifteen years, he had recurring ascites requiring paracenteses at two- to three-year intervals. At the age of twelve, he had been told that he had kidney disease. In 1945, while he was in the army, he had an episode of dull, aching abdominal pain, and some distention was noted at that time. Several paracenteses were done, and a biopsy of the peritoneum through a peritoneoscope was interpreted by the pathologist as a mesothelioma of the peritoneum.

When the patient was presented to the Tumor Conference at the Veterans Hospital in 1952, the tumor board members decided that there was not enough evidence to substantiate the diagnosis of a true mesothelioma of the peritoneum. The patient was discharged, after a paracentesis, with a diagnosis of intermittent ascites of undetermined etiology.

The patient was again admitted to the Veterans Hospital in 1954 with diffuse abdominal pain that finally localized to the right lower quadrant. On this admission, there was definite tenderness to palpation with some spasm and rebound tenderness present in the abdominal muscles. The patient was operated upon, and on opening the abdomen a thick mucoid fluid was found. The entire peritoneal cavity and its contents were noted to be involved with a granulomatous type of peritonitis. Several of these nodules were removed, and sections showed them to be composed of low columnar cells with deep-staining nuclei and abundant pink-staining cytoplasm. The final diagnosis at this time was mesothelioma of the peritoneum.

Following surgery, the patient's symptoms subsided and he was able to return to his normal occupation as a truck driver. Recurring abdominal distention due to ascites has necessitated his return to the hospital for paracenteses on two occasions since operation. When last seen in February, 1957, he was anemic and required several blood transfusions. During the past year, he has lost ten pounds of weight but he still is able to carry on his work.

Discussion.—The diagnosis of mesothelioma of the peritoneal cavity is almost impossible to establish definitely in an antemortem clinical situation. It is far more common to have extensive and diffuse peritoneal metastasis from visceral cancer in the abdominal cavity than it is to find mesothelioma. Furthermore, the peritoneum has a great capacity to undergo metaplasia and to form papillary projections and pseudo-acini, and on occasion even to show squamous metaplasia. The long history of peritoneal involvement in this present case and the findings at surgery of a diffuse and granulomatous

involvement of all the peritoneum stimulated the physicians caring for this young man to consider his problem that of a mesothelioma of the peritoneum. One can infer from the recent clinical course that the tumor is probably malignant, and the patient's condition seems to be worsening at this time.

The description of this tumor indicated that it is most likely the papillary type of mesothelioma, if the diagnosis is correct. However, it must be emphasized that the primary papillary malignant mesothelioma can be simulated very closely by metastatic carcinoma. In addition, it must be recognized that primary benign mesotheliomas exist, as was pointed out in 1935 by Wells. Another type of mesothelioma that can occasionally be cured by surgical excision is the fibrous type reported by Stout in 1951. Willis still believes that primary peritoneal tumors do not exist. In this particular case, the clinical duration of the disease, the microscopic pattern, and the evolution of what appears to be a malignant peritoneal tumor probably warrants the diagnosis of mesothelioma of the peritoneum. It will be of interest to have a thorough examination of all tissue in this patient's body at the time of death, and if no primary source of carcinoma can be demonstrated, the consideration of this tumor as a primary malignant mesothelioma will be substantiated. Such a tumor would be worthy of reporting in the literature.

EOSINOPHILIC GRANULOMA

Case 2.—Pain in the right upper chest of two months' duration brought this twenty-five-year-old man to the Veterans Hospital for admission during January, 1957. A chest x-ray examination had been performed by the family doctor two weeks after the onset of pain and the x-ray findings indicated a normal condition. The pain, however, became progressively worse, radiated around the right side of the chest, and was accentuated by coughing. The pain became so severe that the patient had to stop work one week prior to admission to the Veterans Hospital and he again saw his family physician. A chest radiograph taken at that time showed a destructive lesion in the right ninth rib.

Physical examination failed to reveal a source of primary tumor, but there was considerable tenderness to palpation in the region just below the tip of the right scapula. The patient was studied with a skeletal x-ray survey, and no other lesions were found. An upper gastro-intestinal series x-ray examination and a barium enema x-ray examination revealed no abnormalities. An intravenous pyelogram showed a slight abnormality of the collecting system of the right kidney but an aortogram was performed and this was interpreted as showing a normal kidney. A bone marrow biopsy was also performed and this revealed a normal marrow.

Since no primary lesion could be found indicating a

(Continued on Page 517)

Editorials

JOHN F. BRIGGS, M.D.
ARTHUR H. WELLS, M.D.
HENRY G. MOEHRING, M.D.

TRANSAMINASE TEST

Current thought based on many thousands of tests is that the transaminase or glutamic-oxalacetic transaminase test is the single best laboratory aid for the diagnosis of coronary thrombosis. It does not replace the electrocardiogram. With the use of a commercially developed packet* of well-controlled chemicals and a simple colorimetric procedure, almost any laboratory with a competent technologist can now use the test.

Necrosis of heart or skeletal muscle, liver cells or pancreatic tissues releases relatively large amounts of the intracellular enzyme transaminase into the blood stream where it can be measured directly or indirectly by several different and sufficiently accurate chemical procedures. In both animal experiments and clinical experiences, there is a fairly close direct relationship between the size of a cardiac infarct and the height of rise of the serum transaminase. Unlike the previously widely used laboratory procedures in possible coronary thrombosis cases (red cell sedimentation rate, white blood cell count, and C-reactive protein), this test is practically specific for cell necrosis or serious cell degeneration. The organ site of the lesion must be identified by clinical means.

The time relationship of the apparent onset of coronary occlusion and the level of serum transaminase is of basic importance. The normal level of serum transaminase of from 10 to 40 units is exceeded in from 6 to 24 hours after the onset of symptoms of coronary occlusion. The level frequently reaches 200 to 300 units and occasionally may rise to 600 units. There is a return to normal levels in the average case within three or four days and practically always by the sixth day from the onset of the calamity. These levels and the time element may be of some help in differentiating heart from liver disease.

The test has its greatest critical value in the differentiation of myocardial infarction from (1) angina pectoris, (2) bundle-branch block,

(3) previous healed or healing myocardial infarction, and (4) pulmonary embolism. Active inflammatory diseases of the myocardium result in "positive" blood levels. Thus, the test is useful in the detection of active rheumatic myocarditis.

Bile normally contains large amounts of the enzyme transaminase. In pure mechanically produced jaundice, there is a moderate rise in the blood levels. Active infectious diseases (epidemic infectious hepatitis, homologous serum hepatitis, and infectious mononucleosis) of the liver are associated with extreme elevations in the serum levels to 2000 or more units and they may remain high for periods of many days or even weeks. The same is true in patients with liver injury due to chemicals such as chlorpromazine, pyrazimamide, carbon tetrachloride and cinchophen. Active cases of cirrhosis of the liver generally have very high levels. In other patients with cirrhosis, normal readings may be found. The test has been found "positive" in the great majority of patients with carcinoma metastases to the liver, in spite of the fact that in some instances the metastases are small.

The necrosis in most cases of acute pancreatitis results in abnormally high levels of serum transaminase. Diseases injuring or destroying kidney tubular epithelium should theoretically cause increases in serum transaminase; however, the medical literature has revealed surprisingly little value of the test in the diseases of this organ. The brain also contains large amounts of transaminase, yet there is no consistent variation in serum levels in cases of cerebral infarction. Recently, it has been found that the cerebral spinal fluid is flooded with the enzyme in these patients with cerebral infarction.

The goal in this experimental chemistry sphere of laboratory diagnosis now appears to be the isolation and measurement of enzymes peculiar to specific organs and tissues. Such specific tests may approach the pathognomonic evidence which we are continuously seeking for the diagnosis of disease.

*Sigma Chemical Company, 3500 DeKalb Street, St. Louis 18, Missouri.

CONFESSIONS OF A HOBBYIST

Radio

In the early 1920's, I found myself deep in radio. With a few comparatively inexpensive pieces of apparatus and a flair for experimentation, at that time one could put together a better receiver than any of the crude commercial sets then available. The listening was fun, even if one didn't listen to anything very long, and just "collected stations." One game was to scan the country to see how many high school orchestras were playing "Poet and Peasant Overture." Some of the names are forgotten now, but among them were Hazletine's Neutrodyne and David Grimes' Inverse Duplex circuit. On an impulse, in 1924, I cross-bred these two circuits, and stumbled on what bade fair to be the best circuit in the country. I couldn't do anything with it commercially because of patents, but it was a joy to amateur builders, and when a now extinct magazine, *Radio in the Home*, took it up, I found myself swamped with letters from all over the United States and Canada, from people building Inverse Duplex Neutrodynes. In one mail I would hear from a retired engineer, a priest, the janitor of a movie theatre, a dentist, an R.F.D. postman, and many others. In the IDN, four tubes did the work of six, which, in the days when a tube cost \$6.50, really helped. Reception was on a small indoor box loop. Two manufacturers became interested in what I was doing, and supplied bits of apparatus specially made, when what I wanted was not on the market. The circuit, for those days, had a singularly clear, pleasing tone. I worked at refining it for nearly two years, trying out each new improvement on Station CYL, Mexico City, where someone used to broadcast Beethoven Sonatas every Wednesday evening.

It was wonderful while it lasted. But Armstrong's "superheterodyne" circuit appeared, much easier to handle than the IDN, and it was getting to the point where further experimentation would require more knowledge of electrical engineering than I had, or would have time to acquire. The manufacturers, too, had caught up with and passed the amateurs, and rectifiers and multi-element tubes began to appear. Reluctantly, I dismantled my attic laboratory and began its transformation into a wood-working shop. I still have the original Inverse Duplex Neutrodyne, and if I could get the right batteries and speaker, it would

work today. I wonder how it would sound! I am humiliated to admit that when anything goes wrong with the Capehart that was given me when I had been twenty-five years at the Saint Paul Academy, I just yell for a service-man.

JOHN DEQ. BRIGGS

BOOKPLATE COLLECTING AND EXHIBITING

The first article in this series told of the origin of the bookplate 500 years ago in Europe. In America, we were not far behind. The "Steven Day label" is dated 1642. As time went on, numerous engravers were in the New England colonies and in and around New York, Philadelphia and Baltimore. The year 1749 is the earliest date by an American engraver: Nathaniel Hurd of Boston, known as the best of all those in Colonial times, cut the Thomas Dering plate. Paul Revere, who was a silversmith and engraver, was also in Boston, as we all know. High prices have been paid for the few plates known to be his work. They rank next to the bookplate of George Washington, the most highly valued American bookplate of the early period. The original metal plate which was used for the President's prints is now in the Metropolitan Museum of Art, New York City. There was a rumor that it was destroyed, but this has been definitely disproven.

The fact that bookplates are being used more and more does not mean that they are a new idea but that they are becoming more generally recognized in America. It is the same in other countries. Almost any month's mail will bring to a collector of bookplates, letters and prints from artists or collectors in Europe, even from Australia where there is a national society, and from Java also on the other side of the world, asking to exchange.

There is little expense to this collecting. The custom is to send back the same number of prints as received—one print if only one came, five or six if the sender enclosed five or six. Lists of persons wishing to exchange are often in the Year Books or Bulletins of such well-known organizations as the American Society of Bookplate Collectors and Designers* which has headquarters in Washington, D. C.

There is an Ex Libris Society in London which

*This Society was founded in 1922. The Secretary-Treasurer is Carlyle S. Baer, 3333 McKinley Street, N. W., Washington 15, D. C.

was established in 1890, and there are similar societies in other lands. Stimulus was given to both designers and collectors by the Bookplate Association International which, from its start in 1925 to 1936, inclusive, held yearly exhibitions of bookplates designed by workers in twenty-five countries, each represented by an honorary vice president. Fifty American artists usually participated. The prints became the property of the Association, which voted in October 1935 to give its collection of 6,015 prints to the University of California in Los Angeles.

In America, the Grolier Club of New York, which has an extensive collection, held the first public exhibition of bookplates in 1894. The Grolier Club was organized in 1884 for the study and promotion of the arts pertaining to the production of books, including the occasional publication of books designed to illustrate, promote and encourage those arts. The Club has always included among its activities the collection and exhibition of prints, and a large number of its members are print collectors. The Grolier Club maintains a clubhouse at 47 East 60th Street, New York, where it holds exhibitions from time to time which are open to members and the public, and where it maintains a library of more than 23,000 volumes of books relating to bibliography and the arts pertaining to the production of books. This collection is the outstanding one of its kind in the world. The Club also owns a large collection of prints of all kinds.

The American Bookplate Society (1913-1926) held annual exhibitions at the Avery Library of Columbia University, the Grolier Club or the National Arts Club, New York City, for ten years beginning 1916. The book fairs, such as the New York *Times* book fair at Radio City, Rockefeller Center, the Boston Book Fair and the Northwest Book Fair, exhibit bookplates.

CLEORA WHEELER,
Designer and Illuminator

CALENDAR HISTORY

Astronomers through the early centuries worked constantly to reconcile the calendar with the heavens, but all the time the inaccuracy of eleven minutes, fourteen seconds in the Julian Calendar began to pile up. By the 16th century, the year was ten whole days out of kilter.

The farmer who sowed, tilled and reaped ac-

cording to the feasts of the church was left in a whirl. The moon, sun and stars seemed to be off the beam. Seasons were all out of whack. His world was topsy-turvy and he was shocked to find that religion and agriculture just didn't hit it off any more.

The vernal equinox had been moving back because of the time lost in the Julian Calendar error. By 1500 the equinox set to occur on March 21 was back to March 11, and the perplexed farmer looked forward to eventually doing his plowing in the dead of winter.

Meanwhile, Pope Gregory XIII was looking into the problem. He set aside a room in the Tower of Four Winds in the Vatican City for research. This room is still called the Calendar Room. Here the great astronomers and ecclesiastics met with Pope Gregory to plan a revised calendar. These men had the problem of setting the clock right and of keeping it from gaining or losing, once it was set properly.

In 1582, Pope Gregory decreed that October 4 would be followed by October 15 to take up the 10-day slack. This would set the clock. To keep it running properly, he decreed that years divisible by four would be leap years with the exception of years beginning each century. These century openers would not be leap years unless divisible by 400. By this simple change, it will require 3,323 years before the error in the Gregorian Calendar will amount to a day.

This calendar perfected by Pope Gregory was adopted by Catholic countries immediately. But Protestant nations, such as Sweden, Germany and England, stuck with their Julian calendar and for nearly two hundred years, the two calendars functioned almost side by side, one eleven days behind the other.

Finally, the English Parliament decided enough was enough. It was voted to get back in step with other countries. To adjust things rapidly, it was determined to wipe out or "annihilate," as most folks of the time put it, the eleven days at one time in order for daily activity and the Gregorian calendar to jibe. Thus it was ordered that the calendar for 1752 should skip from September 2 to September 14. This caused considerable confusion in England and in lusty, growing America which was just flexing its economic muscles.

Tenants and landlords squabbled about rents, businessmen in general were upset about contract performances, delivery of goods, payment of bills

Third in a series of seven editorials on calendar history.

and other fiscal operations hinging on the calendar. Anniversaries, birthdays and weddings were all knocked askew by the sudden loss of time. The job of catching up on time in "one fell swoop" was no easy thing. It was a tremendous jolt to the life and economy of the times.

JOSEPH H. SUMMERS,
Brown & Bigelow

ALCOHOLISM IN INDUSTRY

The physician who works with persons employed in industry can do a great deal to bring about a greater understanding of the nature and extent of the alcoholism problem as it affects industry. The better job he does in educating industry, however, the greater will be his responsibility to do something about this problem. As alcoholics in industry are recognized, it will be essential that they receive adequate treatment.

Most persons concerned with the problem of alcoholism are agreed that the physician should be responsible for treatment of the alcoholic. Physicians, however, have often been reluctant to assume this additional responsibility. This is understandable. Although most physicians have accepted alcoholism as a health problem, some have resisted getting involved in the treatment of alcoholics for practical reasons. The treatment of the alcoholic is time-consuming, often discouraging, and frequently poorly rewarding.

One of the reasons that the treatment of alcoholism has been discouraging is that so many of the traditional approaches to treatment do not succeed. Because alcoholism, particularly in its latter stages, is so obvious, it seems logical that straightforward advice should be helpful. Thousands of alcoholics have been told to control their drinking. This is exactly what most alcoholics would like to do—if they could. More recently, with recognition that he cannot control his drinking, the alcoholic has often been warned that he must stop drinking completely. Advice of this kind is of little help to the addictive drinker. He knows he must stop drinking but doesn't know how.

By the time the alcoholic reaches the point where he is looking for help to overcome his drinking, he is usually tense and extremely anxious. The logical thing for the physician to do is to offer the patient some relief from his tension with sedatives.

This is exactly what the alcoholic wants. There is a real danger, however, that the dependency on alcohol or addiction to it may be transferred to another drug which, in the long run, may be more harmful. A major problem confronting institutions or agencies treating alcoholism today is those persons who have shifted their addictions to the barbiturates or have combined alcohol and barbiturates for a more potent effect.

Disulfiram, or Antabuse, has been useful in many cases. However, it must be remembered that this drug, just as the new tranquillizing drugs, does not bring about a cure. Disulfiram simply serves to help the patient resist the urge to drink. Additional help is needed to reorient his thinking; this is considered essential for continued sobriety.

The physician can provide a real service to the alcoholic by helping him to recognize his real problem. Despite what seems obvious to everyone, the alcoholic frequently is the last person to "see" his problem for what it is—a problem with alcohol. Ordinarily, he will blame his problems on his wife, family, job, children, health, financial situation, or anything but his drinking. If these other problems were cleared up, the drinking, he feels, would take care of itself. Through a discussion of the symptoms of alcoholism, the physician can often help the patient to obtain insight into his drinking problem for the first time.

Once the problem is recognized, the next step is doing something about it. This will require deep understanding, sympathy, and above all, patience. The road to alcoholism is a long one and the road back often equally long. Physicians who feel that they do not have the time to continue with the counseling and guidance so necessary for rehabilitation will find an excellent ally in AA. The men and women in AA—who have shared the experience of alcoholism—can often provide the alcoholic with insight into his problem and assist him in his efforts to maintain sobriety by the fellowship they offer. This does not mean that the physician should use AA as a place to dispose of his alcoholic patients. It means instead that the physician, while retaining medical responsibility for the case, is making use of the most effective therapeutic program for alcoholism known today.

Obviously, those patients who come to the physician in the later stages of alcoholism may not be in a position to benefit from the treatment, other than medical, he can provide. They also may not

Final editorial in a series of four on alcoholism in industry.

(Continued on Page 531)

President's Letter

THE ANNUAL MEETING

The 104th scientific assembly and annual meeting of the Minnesota State Medical Association was held in Saint Paul on May 13, 14 and 15, 1957. Objective analysis and comments received from many who were present would indicate that the meeting was highly successful. Registration included 1,496 physicians, and in addition, some nurses, scientific and commercial exhibitors, guests and others, amounting to a total of 3,027. Comments on the scientific sessions were most favorable. The presentations of most of the speakers referred to in my April letter were discussed in glowing terms. Admiral Hyman G. Rickover's thought-provoking banquet address was accorded considerable space in newspapers which commented upon it favorably.

The House of Delegates of the Minnesota State Medical Association made commitments of great significance at this meeting. Annual dues were increased from \$40.00 a year to \$55.00. It should be pointed out that this new figure still leaves our dues well below the dues of all our neighboring state associations. Four dollars of the total of \$15.00 which constitutes the increase is earmarked for the Physicians' Assistance Fund. The other \$11.00 goes into the general fund, and this action becomes consonant with the payment of dues for 1958. The House of Delegates reiterated its request for the broadening of the corporate structure of Minnesota Medical Service (Blue Shield), requesting that all physicians who so desire be made members of the corporate body.

A new scientific committee, to be known as the Committee on Arthritis and Rheumatism, was established, and your President was asked to appoint the members of this committee, which he has done. The House of Delegates voted to sponsor the 1958 essay contest which was developed by the Association of American Physicians and Surgeons. The 1957 contest was won by Sonia Gustavson, of Olivia, who was sponsored by the Renville-Redwood County Medical Society. Her winning essay was entitled "The Advantages of Private Medical Care."

The House of Delegates voted to oppose the extension of social security coverage to physicians.

A new set of By-laws replacing the old Constitution and By-laws was adopted. These By-laws appeared in the March, 1957, issue of MINNESOTA MEDICINE. The old By-laws have been streamlined and modernized, making them consistent, as far as possible, with the By-laws of the American Medical Association. They include the creation of a Judicial Committee, the members of which will be appointed from each council or district. In the future, grievances of one kind or

PRESIDENT'S LETTER

another, whether the complaints are by physicians or laymen, will be considered by this group.

The Distinguished Service Award, presented annually to a physician who has done outstanding service to the state and to medicine, was presented to Dr. W. W. Will, of Bertha, who is also a member of the Fifty-Year Club. He celebrated his seventy-eighth birthday and his fiftieth wedding anniversary on the day this award was presented to him. Special citations for work in the field of tuberculosis went to Dr. Leo G. Rigler, of the University of Minnesota; Dr. Sidney Slater, of Worthington, Minnesota; Dr. William H. Feldman, of Rochester; and to Dr. J. Arthur Myers, of the University of Minnesota. The medal of the Southern Minnesota Medical Association, given for the best scientific exhibit, went to Dr. F. W. Hoffbauer and Dr. F. George Zaki, of the Department of Medicine, University, for their exhibit on "Experimental Fatty Cirrhosis."

Certificates for outstanding work in the field of rehabilitation of the physically handicapped went to Dr. Carl C. Chatterton and Dr. Miland E. Knapp, and were presented by Governor Orville L. Freeman at the annual banquet of the Minnesota State Medical Association on Tuesday evening.

A very successful golf tournament and a successful trap and skeet shoot were held. Names of the winners of these events appear in this issue of MINNESOTA MEDICINE.

The open house on Monday evening and the banquet on Tuesday could well be rated as impressive successes. As always, great credit goes to Mr. R. R. Rosell and his staff for the conduct of the very successful meeting and the clocklike precision with which the entire meeting was carried out.

As successful as the meeting was, a sense of disappointment nevertheless must have entered the minds of the speakers at the scientific assembly as they viewed the scanty attendance on the part of physicians at the lectures, symposia and panels conducted in a large measure by national and international authorities on their subjects. Considering the achievements and reputations of the men on the platform, it was reasonable to hope that a large number of physicians would come to listen to them. Unfortunately, this did not prove to be so. Your President would be greatly pleased to have any suggestions for the improvement of attendance at the scientific session of our Association.

A large, elegant handwritten signature in dark ink, reading "J. M. Bergen". The signature is written in a cursive style with a large, sweeping loop at the beginning.

President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

SERIES OF IMPORTANT RESOLUTIONS PASSED AT ANNUAL MSMA MEETING

Registration at the 104th annual meeting of the Minnesota State Medical Association held in St. Paul May 13, 14 and 15 passed the 3,000 mark with 1,496 physicians, 156 nurses, dietitians and individuals in related fields, 113 scientific exhibitors, 517 commercial exhibitors, 241 members of the woman's auxiliary and 504 miscellaneous guests in attendance. A series of important resolutions was passed by the House of Delegates in its two-day session:

\$15 Increase in Dues

The House voted a \$15 increase in state association dues, from \$40 to \$55 annually. Four dollars of this total is earmarked for the physicians' assistance fund which was about depleted. The additional \$11 goes into the general fund. This dues increase becomes effective in 1958.

Blue Shield

The House of Delegates also renewed its drive for greater physician participation in Blue Shield. A resolution was passed asking that the corporate structure of Blue Shield be broadened to include all participating physicians who desire membership.

New Committee

The House voted to establish a new committee on Arthritis and Rheumatism, the members of which would be appointed by the President of the Association. These appointments have been made.

Social Security

The House resolved to firmly oppose any legislation which would extend social security coverage to members of the medical profession.

Health Insurance Programs

The House also went on record to aid in developing state and federal laws regulating private health insurance programs to prevent unjust rates and practices.

Constitution and By-laws

The House adopted a new set of By-laws replacing the old Constitution and By-laws of the Association. The proposed new By-laws appeared in the March, 1957, issue of MINNESOTA MEDICINE. This recent revision afforded the opportunity to streamline and modernize the old By-laws and make them consistent, as far as possible, with the Constitution and By-laws of the American Medical Association.

Essay Contest

The House voted to sponsor the 1958 essay contest sponsored by the Association of American Physicians and Surgeons. The 1957 contest was won by 18-year-old Sonia Gustavson from Olivia, Minnesota. Her entry was sponsored by the Renville-Redwood County Medical Society with Dr. J. A. Cosgriff, Olivia, in charge. Miss Gustavson's topic was "The Advantages of Private Medical Care."

AMA HOUSE OF DELEGATES ACTS UPON WIDE VARIETY OF SUBJECTS

Revision of the Principles of Medical Ethics, relations with the United Mine Workers of America Welfare and Retirement Fund, the Medicare program, new standards for medical schools, occupational health programs and social security benefits for physicians were among the wide variety of subjects acted upon by the House of Delegates at the American Medical Association's 106th annual meeting held June 3-7 in New York City.

A complete report of the actions of the House will appear in the August issue of MINNESOTA MEDICINE. A brief summary follows:

Principles of Medical Ethics

The House approved the long-discussed revision of the Principles of Medical Ethics submitted at the 1956 annual meeting in Chicago. In approving the new Principles, the House also reaffirmed the "Guides for Conduct for Physicians in Relationships with Institutions," adopted in 1951 and requested the Board of Trustees to devise and ini-

tiate a campaign to educate both physicians and the general public to the dangers inherent in the illegal corporate practice of medicine in its various forms.

Guides for Relations with the UMWA Fund

The AMA House of Delegates also adopted the "Suggested Guides to Relationships Between State and County Medical Societies and the United Mine Workers of America Welfare and Retirement Fund" which were submitted by the AMA Committee on Medical Care for Industrial Workers. In approving the guides, the House also recommended that the Board of Trustees study the feasibility and possibility of setting up similar guides for relations with other third-party groups such as management and labor union plans.

Medicare

The House considered three resolutions dealing with the federal government's Medicare program for the dependents of servicemen. The delegates adopted one resolution condemning any payments under the Medicare program "to or on behalf of any resident, fellow, intern or other house officer in similar status who is participating in a training program." In a second action, the House recommended that the decision on type of contract and whether or not a fee schedule is included in future contract negotiations should be left to individual state determination.

The House also suggested that the AMA attempt to have existing Medicare regulations amended to incorporate the Association's policy that the practice of anesthesiology, pathology, radiology and physical medicine constitute the practice of medicine and that fees for services by physicians in these specialties should be paid to the physician rendering the service.

Medical Schools

To replace the "Essentials of an Acceptable Medical School," initially approved by the House of Delegates in 1910 and most recently revised in 1951, the House adopted a new statement entitled "Functions and Structure of a Modern Medical School." Presentation of the document followed a year of careful study by the Council on Medical Education and Hospitals in collaboration with the Association of American Medical Colleges.

Occupational Health Programs

The House also approved a new statement on the "Scope, Objectives and Functions of Occupational Health Programs" submitted through the Board of Trustees by the Council on Industrial Health. The statement describes and defines orthodox in-plant medical programs as understood in this country today and distinguishes clearly between such programs and the various plans for comprehensive medical care of the sick.

Social Security for Physicians

The House of Delegates reaffirmed their opposition to compulsory coverage of physicians under the Old Age Survivors Insurance provisions of the Social Security Act. They also recommended a strongly stepped-up information program of education which would reach every member of the Association explaining the reasons underlying the position of the House of Delegates on this issue. The House also reaffirmed its support of the Jenkins-Keogh bills.

Election of Officers

Dr. Gunnar Gundersen of La Crosse, Wis., member of the AMA Board of Trustees since 1948 and chairman for the past two years, was unanimously chosen president-elect. He will succeed Dr. David B. Allman of Atlantic City, N. J., who became the 111th president Tuesday, June 4, at the inaugural ceremony in the Grand Ballroom of the Waldorf-Astoria Hotel.

Other officers are: Dr. Jesse Hamer, Phoenix, Ariz., vice president; Dr. George F. Lull, Chicago, secretary; Dr. J. J. Moore, Chicago, treasurer; Dr. E. Vincent Askey, Los Angeles, speaker; Dr. Louis Orr, Orlander, Fla., vice speaker.

The four new members elected to the Board of Trustees include Dr. George Fister, Ogden, Utah; Dr. Cleon Nafe, Indianapolis; Dr. James Z. Appel, Lancaster, Pa., and Dr. Raymond McKeown, Coos Bay, Oregon.

LITTLE HEALTH LEGISLATION ACTIVITY ON CAPITOL HILL

With budget-cutting continuing to keep Congress occupied, bills calling for new Federal spending are keeping their positions on committee shelves. However, the past few weeks have seen some moves of great interest to physicians:

Doctor-Draft Bill

Late in May the House Rules Committee gave the go-ahead signal for floor consideration of the unopposed legislative substitute for the doctor-draft law which expired June 30.

Jenkins-Keogh Retirement Program

Members of the House and Senate received thousands of messages from physicians last month urging enactment of the Jenkins-Keogh retirement legislation. This legislation would (a) allow the self-employed to put up to 10 per cent of their income per year (maximum of \$5,000) into restricted annuity programs or insurance without paying income tax on the amount, (b) receive the money back in the form of pension payments, generally after age sixty-five, and at that time pay income tax on it. Employees of corporations now have the same tax advantage, and (c) impose a tax penalty if the money were withdrawn from the fund prior to the stated retirement age.

Seven associations, including the AMA, have now banded together into a national organization to promote this legislation. The name of the new organization is "American Thrift Assembly for Ten Million Self-Employed." In addition to the AMA, charter members of the new group are the American Bar Association, the American Institute of Accountants, the American Retail Federation, the National Association of Real Estate Boards, the American Dental Association and the National Association of Retail Druggists.

U. S. GP'S SUPPORT BRITISH COLLEAGUES

The American Academy of General Practice recently issued a statement lining their members up solidly behind their British colleagues who are caught between spiraling costs and the Ministry of Health's refusal to grant a promised salary increase. Pointing out that the British medical care plan "has failed miserably and put medicine on a mass production basis," the AAGP urged British family doctors and specialists to resign from the NHS.

U. S. CONTRIBUTION TO WHO BUDGET DROPS

Because Russia and three satellite countries are returning to active participation in the financing of the World Health Organization, the U. S. contribution for the current year will drop to one-third, for the first time since WHO was organized.

AMA PROTESTS PRESIDENT'S BUDGET

Representatives of more than thirty of the nation's largest trade associations, including the AMA, attended an all-day "action conference" in Chicago recently to protest the President's \$71.8 billion budget. The 250 business and professional men were in complete agreement on the salient point that the federal budget can and must be cut.

SURVEY CONDUCTED ON DOCTORS' DUES

A recent survey conducted on dues levied by local and state medical societies as well as by the AMA included a study of how these dues compare with a dozen different professions or trades in a dozen different cities.

In general, the survey revealed that doctors' dues ran higher than most other groups—but not much higher. In a few places, they run lower. Some sample findings are these:

Doctors' dues average about \$100 in the cities surveyed—that is the average of their *total* dues to local, state and national medical societies. The comparable figure for airline pilots is over \$200; for architects, about \$90; for accountants, \$70; for lawyers, \$60, and for steel workers, \$60.

In Baltimore, the doctors pay a total of \$70 in annual dues, but the architects pay \$77.50; in Chicago, the doctors pay \$80, but the lawyers pay \$117; in Newark, the doctors pay \$75, but the architects pay \$95; the bricklayers, \$100. In New York, the doctors pay \$75, in dues; the accountants, \$80; the architects, \$85, and the lawyers, \$106.

BLUE CROSS ISSUES ANNUAL REPORT

Last year, members of Blue Cross received more than \$1 billion worth of hospital care, the largest yearly amount ever paid in the history of hospital prepayment. Blue Cross disclosed these figures in its financial report for 1956. The report showed that 92.7 cents of each subscriber's dollar were returned in the form of hospital service benefits; 6.2 cents per dollar were allocated to Plan operating expenses and the remaining funds were added to Plan reserves.

Nine million Blue Cross members admitted to hospitals last year received more than 53 million patient days of care through the various Plans. Out-patient care is included in these figures. The average hospital stay for a Blue Cross member in 1956 was 7.5 days.

OSTEOPATH, NATUROPATH BILLS PASSED IN UTAH

Two bills permitting naturopaths to perform minor surgery, obstetrical work and prescribe drugs passed the Utah state senate and house and at last report were awaiting the governor's signature.

Other measures passed include a bill permitting hospital staff appointments of osteopaths and the establishment of osteopathic hospitals.

DISABLED "OVER FIFTY" START DRAWING MONTHLY BENEFITS

Men and women workers who have earned at least five years of credit under the federal social security program, are past fifty, and are presumed to be totally and permanently disabled with regard to gainful employment started drawing monthly benefits July 1. Under the definition of the social security law, disability implies that a person must be unable to "do any substantial work, and the disability must be one that is expected to continue indefinitely."

MEDICAL QUACKERY IN MAILS REACHES NEW HIGH

Use of the mails to promote medical quackery is at the highest level in history, Postmaster General Arthur E. Summerfield said recently. The report said that medical frauds today are more lucrative than any other criminal activity and that medical fraud cases now pending represent an annual loss to the public of \$50 million.

Medical frauds most common, in order of popularity, are "dietless" reducing schemes and "sure cures" for cancer, arthritis, skin trouble, baldness and "lost manhood." Mr. Summerfield urged citizens to report suspected mail frauds to the post-office department for prompt investigation.

INJURIES OF THE EXTERNAL GENITALIA

(Continued from Page 504)

as to frequency varying from "never" to "common." Most cases of epididymitis or "strain" are associated with prostatitis and not related to industry. However, there are some instances of undoubted correlation. The common situation involves two men lifting or carrying a heavy object. One man loses his grip and the weight is sud-

denly thrust upon the other, who experiences almost immediate inguinal or scrotal pain. Several hours later swelling and recurrence of pain and rather typical epididymitis appear. The mechanism is reflux of urine and/or prostatic secretion down the vas.

Torsion of the cord is rarely a traumatic lesion in the usual sense. Suffice it to say, this is a strict emergency and any salvage must be accomplished in less than three hours.

CASE STUDIES, MINNEAPOLIS VETERANS HOSPITAL

Eosinophilic Granuloma

(Continued from Page 507)

source for metastatic disease, the patient was presented to the tumor conference, and a decision to remove the area "en bloc" was made. The surgery was performed, removing the ninth rib together with a part of the eighth and tenth ribs and the intervening intercostal muscles. The pathological examination of this tissue showed dense sheets of mature and immature eosinophils associated with numerous nonlipid histiocytes. The diagnosis of this tumor was eosinophilic granuloma. The patient recovered uneventfully from the surgery and at the present time is free of symptoms.

Discussion.—This patient has an eosinophilic granuloma in one of the common sites for this type of lesion, namely, the ribs. Other bones that are commonly involved are the bones of the cranial vault, the vertebrae, and particularly the humerus and the femur. This type of eosinophilic granuloma represents the mildest manifestation of a group of diseases that probably are all basically the same. The other two components of this triad are, Letterer-Siwe disease (which occurs predominantly in younger children under the age of two years) and Hand-Schüller-Christian disease (which frequently involves multiple bones at a given time). The Letterer-Siwe disease is usually associated with skin manifestations and visceral involvement, and the disease is 100 per cent fatal. Hand-Schüller-Christian disease does not involve skin but it occasionally affects the pituitary gland, causing diabetes insipidus. The latter disease may cause exophthalmos, and lesions in the lung are often seen. This disease also may lead to death.

The prognosis, however, for a simple eosinophilic granuloma of the bone in a patient of the age in this case report, is good. These lesions are radiosensitive and can be treated and cured with small amounts of irradiation. On occasion, recurrences after surgery have disappeared with properly applied irradiation therapy. In the present instance, the choice of total removal of this primary and localized tumor was wise, but in the event that extension of the disease had occurred and it manifests itself later in surrounding tissues, deep roentgen irradiation would be the therapy of choice.

Minnesota State Medical Association

Highlights of the 104th Annual Meeting

NEW OFFICERS ELECTED

Dr. H. B. Sweetser, Minneapolis, was named president-elect of the Minnesota State Medical Association during the 104th annual meeting of the group in St. Paul in May. He will take office January 1, 1958. A native of Minneapolis and a specialist in internal medicine, Dr. Sweetser graduated from Harvard Medical School. He is the son of the late Dr. H. B. Sweetser of Minneapolis. His mother was one of the founders and the first president of the state Woman's Auxiliary.

Dr. Sweetser has served for five years as counselor from the sixth district. He will be succeeded by Dr. Donald McCarthy of Minneapolis. Dr. McCarthy is former treasurer of the Association and will be succeeded by Dr. Karl Anderson, Minneapolis.

Other new officers, all to take office January 1, include Dr. T. R. Fritsche, New Ulm, first vice president; Dr. Wallace P. Ritchie, St. Paul, second vice president, and Dr. R. P. Buckley, Duluth, vice speaker of the House of Delegates.

Dr. B. B. Souster, St. Paul, was re-elected secretary; Dr. H. M. Carryer, Rochester, former vice speaker, was named speaker of the House of Delegates. Dr. C. G. Sheppard, Hutchinson, fourth district, and Dr. J. P. Medelman, St. Paul, fifth district, who had been appointed to the Council to replace Drs. H. J. Nilson, Mankato, and L. R. Critchfield, St. Paul (deceased), were officially elected councilors for their respective districts. Dr. C. L. Oppegaard, Crookston, was re-elected to succeed himself as eighth district councilor. Dr. Oppegaard is also chairman of the Council.

Re-elected delegates to the AMA are Drs. George Earl, St. Paul, and O. J. Campbell, Minneapolis. Re-elected alternates are Drs. E. M. Hammes, St. Paul, and C. L. Oppegaard, Crookston.

SOUTHERN MINNESOTA MEDAL RECIPIENTS

Dr. F. W. Hoffbauer and Dr. F. George Zaki of the Department of Medicine at the University of Minnesota received the medal given by the Southern Minnesota Medical Association each year for the best scientific exhibit at the annual meeting. Dr. Charles Strobel, Rochester, president of the Association, made the presentation at the annual banquet of the Minnesota State Medical Association, Tuesday, May 14.

The award-winning exhibit concerned "Experimental Fatty Cirrhosis."

DISTINGUISHED SERVICE AWARD

Dr. W. W. Will, Bertha, received the distinguished service award presented by the Minnesota State Medical Association at the annual banquet of the group at the Hotel Saint Paul, May 14.

Dr. Will became a member of the Council in 1927, served as president of the Association in 1936, was speaker of the House of Delegates from 1938 to 1946, has served as an alternate delegate to the American Medical Association and has held various important committee appointments.

In 1948, he was named the "outstanding general practitioner in Minnesota."

Dr. Will also joined the "Fifty Club" group this year. The day he received these honors (May 14) was his seventy-eighth birthday and his fiftieth wedding anniversary.

SPECIAL CITATIONS

Four Minnesota men were honored for their work and research in the field of tuberculosis at the annual banquet of the Minnesota State Medical Association, May 14.

Each received a special citation presented by Dr. C. L. Oppegaard, Crookston, chairman of the Council.

These men include Dr. Leo G. Rigler, formerly head of the Department of Radiology at the University of Minnesota, now in Los Angeles; Dr. J. Arthur Myers, who has just retired from his post at the University of Minnesota and who initiated the county accreditation program for the control of human tuberculosis; Dr. William Feldman, Rochester, who was cited for his work in the development of basic medical knowledge of the antibiotics, and Dr. Sidney Slater, Worthington, superintendent of the Southwestern Minnesota Tuberculosis Sanatorium for thirty-eight years and the man who initiated the routine use of the Mantoux tuberculin skin test in the schools of his district.

GOVERNOR PRESENTS TWO SPECIAL AWARDS

Governor Orville Freeman presented two special awards at the annual banquet, May 14, both to physicians who have contributed much in the field of physical medicine and who have worked for many years to rehabilitate handicapped individuals. The two Minnesotans honored were Dr. Miland E. Knapp, Minneapolis, and Dr. Carl C. Chatterton, St. Paul. Dr. Knapp was saluted

for his many years of service to the Kenny Institute and Dr. Chatterton, for his long-time service as chief of staff of the Gillette State Hospital for Crippled Children.

DOCTOR ADCOCK ADDRESSES WOMEN PHYSICIANS

Dr. Madeline Adcock, Glencoe, Minnesota, was the chief speaker at the luncheon held by the American Medical Women's Association, Inc., Minnesota Branch No. 26, May 13, at the St. Paul Athletic Club.

Dr. Adcock spoke of the four years she and her husband spent in a bush village 250 miles inland from the ocean in Ghana, Africa.

Dr. Helen Knudsen of the Minnesota Department of Health received honorable mention at the luncheon. She was named "Woman Doctor of the Year" last year.

WINNERS OF SPORTS EVENTS

Skeet and Trap

Dr. Harold R. Tregilgas, South St. Paul, chairman of the skeet and trap shooting events held in conjunction with the 104th annual meeting, Sunday, May 12, announces the winners of the various shooting events and their prizes, as follows:

In the skeet category, Dr. Earl Barrett of Duluth won the first place cup presented annually; Dr. Tregilgas took second place, receiving a shell box donated by the Gokey Company, St. Paul. Their scores were 45 and 44, respectively. Dr. Richard Tucker, Minneapolis, won third prize with a score of 44. He received a Cary thermometer presented by the U. S. Vitamin Corporation.

For fourth place in skeet with a score of 44, Dr. Malcolm Pearson, St. Paul, won a \$10.00 merchandise bond from Roy Novotny Sporting Goods, St. Paul. Dr. Baxter A. Smith, Jr., Minneapolis, won a pair of sunglasses donated by Northwest Opticians, St. Paul, as fifth place winner with a score of 43. Dr. Joseph Bicek, St. Paul, received the low net prize which was a set of golf balls contributed by the Skeet and Trap Committee.

In the trap event, Dr. Albert C. Kelly received the first prize cup for the second year with a score of 42. Dr. Malcolm Pearson took second place and received a \$10.00 gift bond from V. Mueller and Company. Dr. William H. A. Watson, St. Paul, took third place with a score of 42; his prize was a watch band contributed by the Desitin Chemical Company. Fourth place winner was Dr. Earl V. Wetzel, St. Paul, who scored 41; Dr. Wetzel received a razor from the Hall, Anderson, Nordine Pharmacy, St. Paul. Dr. Tregilgas placed fifth and received a mechanical pencil contributed by Ciba Pharmaceutical Products, Inc.

Dr. Malcom Pearson received his third prize of the day as first place winner in the razzle-dazzle

skeet shoot. He was presented with a cup for his score of 21. Dr. Baxter Smith, Jr., took second place and received a Howe table contributed by Brown and Day, Inc. Dr. Robert Tenner, Minneapolis, scored 17 and received a prize donated by Moudry's Apothecary Shop, St. Paul. Dr. Tregilgas took fourth place and received a barbecue gong from Rowell Laboratories. Dr. Richard Tucker placed fifth with a 16 score and received a razor from Hall, Anderson and Nordine Pharmacy.

Members of Dr. Tregilgas' committee for the shooting events were Drs. L. J. Michienzi, N. M. Palm and E. A. Smisek, St. Paul.

Golf

Winners of the annual all-physician golf tournament held Sunday, May 12, at the White Bear Yacht Club, Dellwood, have been announced by golf chairman, Dr. B. G. Lannin, St. Paul.

Taking first place in the low gross category was Dr. Philip A. Olson, Minneapolis, with a score of 73. Dr. Olson won an electric frying pan contributed by the St. Paul Fire and Marine Insurance Company. Dr. Wallace J. Olson, Minneapolis, was second place winner, also with a score of 73. His prize was a carving set presented by Smith, Kline and French Laboratories. Dr. S. H. Calin, who placed third with a score of 76, received a set of golf balls from Hoffmann-La Roche, Inc. Dr. Lannin, fourth place winner with a score of 78, received a dictionary contributed by the W. B. Saunders Company. Dr. L. C. Lick, St. Paul, received a set of golf club covers from Ortho Pharmaceutical Company as fifth place winner.

Dr. J. A. Nesse, Austin, who took first place in the low net category, received a lazy Susan contributed by Eli Lilly and Company. Dr. E. M. James, St. Paul, second place winner, won a waste basket from Brown and Day, Inc. Third place winner, Dr. D. H. Correa, Minneapolis, received golf balls from Hoffmann-La Roche, Inc. Dr. P. C. Leck, Austin, came in fourth and won a pillow donated by C. F. Anderson Company, Inc. Fifth place winner, Dr. C. O. Erickson, Minneapolis, received a timer from General Electric.

Drs. V. P. Hauser, St. Paul; John Dordal, Sacred Heart; E. C. Burseth, Mora; C. L. Lick, St. Paul, and H. H. Noran, Minneapolis, were winners in the blind bogey event. Their prizes, respectively, were a billfold from Ulmer Pharmaceutical Company, a barbecue gong from Rowell Laboratories, a watchband from Desitin Chemical Company, a mechanical pencil from Ciba Pharmaceutical Products and a phone directory from Physicians and Hospitals Supply Company.

Door prizes were contributed by Holland-Rantos Company, Inc., and Merck Sharp and Dohme.

Members of Dr. Lannin's golf committee were Drs. S. H. Calin, E. C. Gibbs, V. P. Hauser, T. W. O'Kane, W. J. Paulson and E. L. Strem, St. Paul.

ART AND HOBBY SHOW WINNERS

Winners in the art and hobby show presented during the 104th annual meeting in St. Paul have been announced by Dr. Vernon D. E. Smith, St. Paul, chairman of the event.

In the oil paintings division, Dr. Carl O. Rice, Minneapolis, took first place with his "North Shore Scene"; Dr. Byron Armstrong, Hopkins, took second place with his "Autumn Scene." Receiving honorable mention were Dr. D. A. Limbeck, Le Sueur, for "Melancholy Clown" and Dr. Paul Brabec, Hastings, for "Portrait of an Old Man" and "Portrait of an Old Woman."

Dr. James L. Benepe, St. Paul, took first place in the watercolor division with his "Fall Field"; Dr. Donald B. Swenson, St. Paul, took second place for his "Skyline" painting.

Taking first place for the best "single exhibit" in the watercolor division was Dr. John Coe, Minneapolis, for his "Impressions of the City."

Dr. James H. Crowley, St. Paul, took first place in the sculpture division.

In the "hobbies" section, Dr. Arthur W. Garbrecht, Minneapolis, took first place for his collection of gold and silver coins. Dr. F. A. Zinter, Minneapolis, placed first in the handicrafts division for his silversmithing and hand-made jewelry. Dr. Henry H. Michel, Minneapolis, took second place in this division with his model locomotive. In the photographic prints division, Dr. F. H. Walter, International Falls, took first place with his "Depot Scene."

In the "inventions" category, Dr. John Wild, of Minneapolis, took first place with his steam out-board motor exhibit.

THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

230 Lowry Medical Arts Building, Saint Paul 1, Minnesota

F. H. Magney, M.D., Secretary

PHYSICIAN'S LICENSE SUSPENDED FOR THREE YEARS

On May 25, 1957, the Minnesota State Board of Medical Examiners suspended for a period of three years the medical license held by Nicholas G. Boosalis, M.D., because of his personal use of narcotic drugs. Dr. Boosalis had previously appeared before the Board on February 10, 1956, for similar misconduct, at which time he was permitted to retain his medical license by entering into a stipulation with the Board, in which he agreed to the surrender of his narcotic privileges until the further order of the Board and also to refrain from the personal use of narcotic drugs. Dr. Boosalis at that time had completed a period of hospitalization for the treatment of his illness and was on the medical staff of a United States Veterans Hospital outside the State of Minnesota. However, it subsequently came to the attention of the Minnesota State Board of Medical Examiners that Dr. Boosalis had violated the terms of the stipulation by indulging in the personal use of demerol, which he obtained from the drug supply of the hospital where he was employed.

Dr. Boosalis was born in Faribault, Minnesota, in 1915 and received an M.D. degree from the University of Minnesota in 1941. After serving his internship in Duluth, Dr. Boosalis was licensed by examination to practice medicine in Minnesota in February, 1941. After serving in the United States Army, Dr. Boosalis engaged in the private practice of medicine for more than a year in Colorado and also served as a staff physician at Veterans Hospitals in several states.

PHYSICIAN'S LICENSE REVOKED

On May 25, 1957, the Minnesota State Board of Medical Examiners revoked the license to practice medicine and surgery held by Philip C. Welton, M.D. because of his habitual indulgence in the excessive use of alcoholic liquors and his numerous court convictions for drunkenness. Dr. Welton, who is forty-eight years of age, formerly engaged in the practice of medicine in Minne-

sota, but since 1950 he has practiced in Wisconsin, his present address being 517 W. Wells Street, Milwaukee, Wisconsin. Dr. Welton had not paid his annual registration fee to the Minnesota State Board of Medical Examiners since 1952, and when he made inquiry in regard to the amount of the arrearage, the Board discovered that Dr. Welton had a number of court convictions in Milwaukee, Wisconsin, for drunkenness and that he had agreed to the voluntary surrender of his Wisconsin medical license as a result of his conduct. A citation was therefore issued by the Board on March 9, 1957, requiring Dr. Welton to show why his license should not be revoked. Although Dr. Welton received a copy of the citation, he did not appear at the hearing before the Board on May 24.

Dr. Welton's medical license was previously suspended by the Minnesota State Board of Medical Examiners on December 29, 1949, due to his failure to appear in response to a citation in which he was charged with having been committed to the Rochester State Hospital as mentally ill on June 24, 1949, and with habitually indulging in the excessive use of alcoholic liquors and barbiturate drugs. The Board ordered that Dr. Welton's license be suspended until he made a personal appearance in response to the citation. On February 10, 1950, Dr. Welton appeared before the Board and indicated that he had taken steps to rehabilitate himself and that he desired to obtain licensure in Wisconsin to enable him to be employed as a staff physician at a sanatorium there. After it was ascertained that Dr. Welton had been restored to legal capacity by the Probate Court of Wabasha County on October 10, 1949, and that he was willing to enter into a stipulation with the Board in reference to his future conduct, the Board terminated the suspension of Dr. Welton's license.

Dr. Welton was born in Pewaukee, Wisconsin, on May 8, 1909. He received an M.D. degree from Marquette University in June, 1937, and was licensed in Minnesota by examination in the same month. In addition to practicing medicine in Wisconsin Dr. Welton has practiced in Utah and Arizona and has also served as a staff physician in sanatoriums in Nopeming and Wabasha, Minnesota.

History of Medicine in Minnesota

THE HISTORY OF MEDICINE IN POLK COUNTY

J. F. NORMAN, M.D.
Crookston, Minnesota

(Conclusion)

Julien F. Gendron was born at St. Francis in Montmagny, Province of Quebec, Canada, on March 31, 1868. He died September 11, 1947. He was well known in Canadian literary circles as a poet, doing his writing in French. He once was Poet Laureate of Canada. He studied law at Laval University, graduated from the University of Quebec, and later, studied at Hamline University in St. Paul, where he received his medical degree in 1896. Dr. Gendron practiced for a time at Centerville, Crookston, and Red Lake Falls, and in 1900 began practice in Grand Rapids where he served as Health Officer and Examiner for the American Veterans Bureau. He served as Captain in the American Army Medical Corps in World War I. He was a member of the Range Medical Society, Medical Staff of Itasca County Hospital at Grand Rapids, a member of the St. Louis County Medical Society, the Minnesota State Medical Association, and the American Medical Association. He was also licensed in California and took postgraduate work at the Chicago Polyclinic, Tulane University and Mayo Clinic at Rochester.

He was a member of the Society of French Canadian Poets, several works in verse were never published but his greatest epic was "La Legende des Chevalier d'Oil" (1928). It was heralded as the first epic in French since Voltaire. His second was "La Laurentiade," which was a story of the siege of Quebec. The *St. Louis County Bulletin* of October, 1947, summed up in Dr. Gendron's obituary with the statement: "A gentleman and a scholar has passed on." He was survived by his widow and a son, Bertrand, who is a druggist in Brainerd, Minnesota.

Herbert H. Hodgson was born June 13, 1870 at Kleenburg, Ontario, and was naturalized in 1900. He had preliminary education at Walkerton, Ontario, High School and attended college at Toronto, when he was graduated in 1894. He was graduated in medicine from the Trinity Medical College in Toronto in 1898 and was licensed that year. He first located at Fisher in the 1890's. He later moved to Crookston and married Adelaide Marin in July, 1899. He was associated with the Crookston Clinic but retired from active practice in 1941 because of coronary obstruction. He was a member of the Red River Valley Medical Society, the State Medical Association, American Medical Association and of the Masonic Blue Lodge No. 141. He was an active member of the staffs of both Crookston hospitals. Dr. Hodgson had a large practice, both hospital and general, with some country work. In his early residence in Crookston, before cars were in general use, he made his calls with a buggy drawn by a beautiful bay horse. He was an examiner in Local Board No. 2, Polk County, and was a county physician and city physician. He practiced in Polk County for more than forty years. During that time he took a number of postgraduate courses in medicine and surgery. He died July 3, 1949, while visiting his daughter, Dr. Jane Hodgson (Quattlebaum) of St. Paul. A second daughter, Mrs. Kathryn Stocklan, lives in Chicago. He made his home at

231 Washington Avenue, Crookston, where Mrs. Hodgson still resides. He was affiliated with the Methodist Church, his father, John Hodgson, having been a Methodist Episcopal clergyman. Dr. Hodgson was an ardent sportsman, going out hunting every fall for deer and spending considerable time fishing in season. He had a summer home at Union Lake.

Halvor Holte was born near Stavanger, Norway, July 11, 1857. He came to America with his parents in 1872 at the age of fifteen. He graduated from the University of Minnesota in 1893 and was licensed in 1895. He started to practice in Crookston and continued there until his death. He attended St. Olaf Academy and St. Olaf College and did postgraduate work in Berlin, Germany, in 1905. He practiced for a while in partnership with Dr. O. L. Bertleson of Crookston. Church affiliation was with United Lutheran Church, English Lutheran Church. He was a member of Sons of Norway and Scandinavian American Fraternity. Dr. Holte was a staff member of Bethesda and St. Vincent Hospitals, Crookston. He was also active in the Red River Valley Medical Society (past secretary), Minnesota State Medical Association and American Medical Association, as well as the Citizens League of Polk County (past president). He helped establish Bethesda Hospital in 1897 and launched the movement for the creation of Sunnyrest Sanatorium at Crookston. He also was director of the Crookston Association of Public Affairs and was on the board of the local banks. In business circles, he was a director of the Scandia-American Bank of Crookston and of the Crookston Commercial Club. He was past president of the Norman County Tuberculosis Sanatorium commission, a member of the American Public Health Association, director of the Minnesota Public Health Association, and a fellow of the American College of Surgeons (1920). He practiced as late as December 30, 1936. He died January 2, 1937, at Bethesda Hospital in Crookston at the age of seventy-nine. He was the first homesteader at Holt, Minnesota, which was named for him. His wife, the former Henriette Lunde of Maplebay, survived him and at present lives in Crookston (1953).

C. P. Johnson was listed in Crookston in 1890. Nothing is known of him.

Syvart H. Johnson practiced in Climax in 1898. He is listed there in 1903 and 1905. In 1909, he is listed in Bellingham, Washington. He graduated from Jefferson Medical College, Philadelphia, in 1897 and was licensed in the same year, June 10, 1897 (License No. 812). He died in Bellingham, June 20, 1942, from cerebral thrombosis at the age of seventy-two.

August (Adolph) Just, a homeopath, was practicing in Crookston in 1886. He was born in Dodge County, Wisconsin, on November 23, 1851. He was rich in well-merited affection and respect of the people of Crookston, his fellow citizens. In 1881, he graduated from Hahnemann Medical College and Hospital, Chicago, and settled in Crookston the following year. He built a comfortable practice and was a very good ether anesthetist, helping the surgeons of the city. He was a member of the Congregational Church in Crookston. He died suddenly in 1923. He had gone up to his office in the evening, and stepped out to an adjoining office, where he dropped to the floor unconscious and died almost immediately. When found, the lights in his office were still burning, and on his desk was a volume on medicine open at an article on heart diseases.

George Paul Kirk started his practice of medicine in 1896 in East Grand Forks where he still lives (1954). He was born June 8, 1875, in St. Paul and attended the Medical School of the University of Minnesota, where he graduated in 1895.

He had a one-year internship at the City and County Hospital in St. Paul and started to practice in East Grand Forks in 1896. In about 1897, he married Anna M. Schilling of Hastings. They have three children: Cyrus, who is in agricultural work in Canada; Paul, who played good football for Minnesota about 1940; and Dorothy, who is married and lives in Fargo, North Dakota. Dr. Kirk was health officer of East Grand Forks and was on the staff of St. Michael's and Deaconess Hospitals. He is a member of the Red River Valley Medical Society and the Minnesota State Medical Association.

Frank H. Knickerbocker was registered in Crookston and in Fertile. He graduated from the Detroit Medical College, Detroit, Michigan, in 1879 and was licensed in 1889 (Certificate No. 44-B). The record of births and deaths at the city of Henderson, Sibley County, Minnesota, show that he was in Henderson, February 10, 1893, and was still there until March 10, 1899. The people there who knew him stated that he was a tall, fine looking gentleman, who took an active part in civic affairs, gave much attention to the public schools, and was on the local school board. He is remembered by a former country boy, to whom he gave a lift on a dusty road. He is remembered also for his kindly interest in this boy, the boy's schooling and other problems. He was married and had two children, and settled at Anoka. Later he went to Staples, where he continued to live during the early 1920's. He died November 17, 1923. He was a member of the Upper Mississippi Medical Society and the State Medical Association.

Howard Lancaster apparently practiced in Fisher as early as 1890, and is listed there in Polk's Medical Directory as late as 1896, though other directories list him there in 1898. He was born in England about 1846 and came to the United States in 1887. He started to practice in Grand Forks, North Dakota, and was licensed in Minnesota by exemption on December 31, 1883 (License No. 590-1). Between 1898 and 1903, he was in St. Paul where he served as City Health Commissioner from 1910 to 1914. During the influenza epidemic in 1918, he volunteered his services to the government in October of that year, although he was seventy-two years old. Dr. Lancaster retired in 1919 and went to Louisville, Kentucky, to live with his son. While on the way to visit his daughter in Milwaukee, he became seriously ill and died in Milwaukee on July 30, 1920. He was survived by his widow, two sons, and a daughter. He was a genial and highly respected physician, known to everyone by his long, flowing white beard.

John Felix Landry settled in Crookston about 1886 and in Gentilly briefly in 1890. He was born at Carleton, Province of Quebec, Canada, on January 31, 1856. He graduated from Laval University, Canada, in 1880. His Minnesota license was issued April 22, 1884, by diploma (No. 881). In 1890, 1895, and 1898, he was listed in Duluth, in 1903 and 1905 without an address, and in 1909 in Osseo, Hennepin County. Dr. Landry retired in 1928 after having practiced fifty-three years. He died February 4, 1938, in Minneapolis from coronary sclerosis at the age of eighty-two and was buried in St. Mary's Cemetery in Minneapolis. He was survived by four daughters: Mrs. Leontine Sherlock, St. Paul; Mrs. F. R. Horeish, St. Paul; Mrs. Fred B. Peterson, Minneapolis; and Mrs. William Ryan, Seattle; and by two sons: J. Robert Landry, Minneapolis, president of the Landry Transfer Company, and Arthur Landry. His wife, Rose Ann Landry, preceded him in death.

Israel Lemieux was born in St. Urban, Chateaugnay, Quebec, April 9, 1852. He had a good classical education and graduated from Bishop's Medical College,

Montreal, in 1874. After practicing for several years in Canada, he came to Minnesota in 1880. He probably was in Fertile before settling in Red Lake Falls about 1883. Two years later he moved to St. Louis, Mississippi, but returned to Red Lake Falls after about two years because his wife's health could not tolerate the climate in Mississippi. He was licensed in Minnesota in 1883 and in Mississippi in 1885. In Red Lake Falls Dr. Lemieux was greatly interested in civic and church affairs; he was president of the village council, and city mayor for several towns. He also served as county physician and health officer there for many years. He was married twice and died October 16, 1935.

C. Archibald Leslie or (Archibald C. Leslie) practiced in Fisher from about 1895 through 1900. He was a graduate of McGill University in 1890, and was licensed in Minnesota, October 10, 1890 (License No. 129). In 1903 and 1905, he is listed in Snyder, Texas, and in 1909 in Hannaford, North Dakota. Later he was apparently located at Kathryn, North Dakota. He died about October 23, 1914, at McVile, North Dakota, at the age of fifty-four.

Adolph Oscar Loe practiced in Crookston in 1898, but in 1903 he is listed in Seattle, Washington. He died there suddenly on July 31, 1935, at the age of sixty-three. Dr. Loe was a graduate of the College of Medicine and Surgery of the University of Minnesota in 1897, and was licensed in the same year on June 10 (Certificate No. 817). He was a member of the Pacific Coast Surgical Association, a fellow of the American College of Surgeons, past president of the King County Medical Society, a member of the State Board of Medical Examiners, and was on the staff of the Seattle General Hospital.

Quincy A. Low: (Dr. Low's full name was John Quincy Adams Low).^{*} Dr. Low was born in Vermont in 1848 and came to this part of the country with his parents in 1860, when they settled in Winona County, Minnesota. After having lived on a farm he enlisted at the age of seventeen in the Second Minnesota Regiment of Cavalry in February, 1865, and was discharged in November of the same year. After his return, he entered Hamline College at Red Wing and completed his course in four years. Then he read medicine for three years with Drs. William H. H. Richardson and Franklin Staples of Winona, and during this time he completed two courses of lectures at the University of Michigan Medical Department. He graduated from the Long Island College Hospital, New York, in 1873, where he also took some special training in surgery.

Shortly after graduation, he practiced in Rochester, Olmsted County, in 1873. In January, 1874, he moved to Wabasha where he remained in practice for twenty-five years. He became a member of the Wabasha County Medical Society, and was its secretary for several years. He was elected to membership in the State Medical Association at an early period and also joined the American Medical Association. He received his Minnesota license in 1883 and in the same year became health officer of Wabasha County. In the early Nineties, he was a member of the local United States Board of Pension Examiners. It was not until about 1900 that he moved to a farm near Crookston, where he continued to practice medicine.[†] This he continued until 1907, when he moved to California.

Archibald McEachran practiced in McIntosh about fourteen years. He was

^{*}"History of Medicine in Wabasha County," MINNESOTA MEDICINE, p. 925 (Nov.) 1944. "Medicine and Its Practitioners in Olmsted County Prior to 1900," MINNESOTA MEDICINE, pp. 65-66 (Jan.) 1951.

[†]*The Northwestern Lancet*, (Nov. 15) 1907.

born in Crinan, Ontario, on May 26, 1866, and attended high school in the same town. He received his medical education at the University of Michigan at Ann Arbor, Department of Medicine and Surgery, graduating in 1889. He came to McIntosh in the same year and remained there until at least 1903. His Minnesota license is dated October 4, 1889 (License No. 84). From 1905 on, he is listed in Minneapolis. His death notice in the *Journal-Lancet* of May 14, 1935, states that he died in Minneapolis on April 11 of that year, having practiced there for more than thirty years. At the time of his death he was sixty-nine years old. He had taken postgraduate courses in Chicago in 1896 and 1903 and in Christiana, Norway, in 1904. During the first world war, he was acting captain in the British Canadian recruiting commission at Minneapolis, July, 1917, to October, 1918. He was a member of the Hennepin County Medical Society, the Minnesota State Medical Association, and the American Medical Association. He was in general practice a total of forty-six years, continuing until about a month before his death. Dr. McEachran was survived by his wife, Amy B. McEachran, two sons, Stewart and Beresford, and several brothers and sisters. He was a member of the Masonic Lodge, the Odd Fellows, MWA, and KOTM.

Daniel McEachran was in Fosston around 1896. He graduated from the University of Michigan in 1886 and was licensed in North Dakota in the same year. He received his Minnesota license on January 7, 1889 (Certificate No. 45) and was licensed in Washington in the same year. He apparently was in St. Paul in 1890, and a Minnesota Directory lists him in Fosston in 1895. In 1896, he and Dr. Umland were the only legally licensed physicians in Fosston. It is not known how long he stayed there, but in 1909 he is listed in Stanwood, Washington. He died on February 25, 1925 in Seattle.

Malcolm McKinnon was practicing in Erskine in 1896, but apparently remained there only a short while. He had graduated from Trinity Medical College, Toronto, Ontario, Canada, in 1895 and was licensed in Minnesota in the same year on June 11 (Certificate No. 550). In 1898, a Minnesota Directory lists him in Roseau, while in 1903 and 1905 he is listed in Fosston, and in 1909 in Sand Point, Idaho. Dr. McKinnon was killed in an automobile accident near Baker City, Oregon, in July 1919.

Thor O. E. Moeller was in Fertile in the 1890's. He was born about 1863 and studied medicine at Rush Medical College, Chicago, graduating from that school in 1892. He was licensed on June 14, 1896 (Certificate No. 613) and is listed in Fertile in that year and in 1898. Then he moved to North Dakota; he was in Hillsboro around 1903 and 1905, later in Devils Lake and Lisbon. He served in the first World War. In 1927 he was listed in Chicago. Dr. Moeller died in Fargo in the Veterans Administration Hospital on September 3, 1950 at the age of eighty-seven.

George Alfred Morley was born in Necedah, Juneau County, Wisconsin, March 15, 1868. His father, Alfred Morley, was born in the state of New York; his mother, Jane Stinson, in Ireland. He graduated from Rush Medical College, Chicago, in 1897 and was licensed in Minnesota in the same year specializing in diseases of the eye, ear, nose and throat. At one time he was pension examiner. He was on the staff of St. Vincent and Bethesda Hospitals. He was a member of the Red River Valley Medical Society, serving in several of the offices of the Society, Minnesota State Medical Association, American Medical Association and Academy of Ophthalmology and Otolaryngology. Dr. Morley was an outdoor man, and had one of the first cars in Crookston. He later owned a White Steamer. He died November 18,

1947 at the age of seventy-nine, when he was the oldest practitioner of Crookston. He had been president of the Crookston School system. His wife, Stella McIntyre Morley, took an active part in club work and the Medical Auxiliary. She preceded him in death. He left two children, Donna and Robert Morley.

Andrew Nelson practiced in Maplebay in 1896. Nothing is known about him. However, a Dr. Anders Nilsen, whose name is occasionally given as Andrew Nelson and Anders Nielson, was at Lillian Lake, Kandiyohi County, between 1894 and 1909. There is a possibility that these two are identical.

Arne Nelson came early to Polk County, locating in Aldal in 1880 or 1881. Before that he had practiced in Hartland, Freeborn County, from 1878 and 1880.** From 1890, he is listed in Fertile until his death on May 2, 1908. He was born March 9, 1851 in Norway and was a physician as well as a druggist. He died at the age of fifty-seven from the after effects of injuries sustained in a fall.

Paul O. Neraal (P. O. Nerall) graduated from the University of Iowa, Iowa City, in 1897 and was licensed in the same year on June 10 (Certificate No. 825). He practiced in Independence, Iowa, for a while in 1897 and 1898, but it seems he soon moved to McIntosh where he practiced until at least 1909. He was considered a capable physician. Later he went into a large practice in the West. In 1927, he was listed in Cut Bank, Montana, where he is still located (1956).

Ole Hansteen Olson is listed in the medical directory of 1900, in Erskine. He did much country work there. During his later years, he was not well, finally retiring about 1930. He was born in Norway, October 23, 1862. He was married and had four children. Dr. Olson, who was licensed in 1887, was a member of the Red River Medical Society and the Minnesota Medical Association.

John Nelson Risjord (Richard) was born in Telemarken, Norway, on December 22, 1863 and came to the United States in 1882, locating at Mt. Horeb, Wisconsin. The following year, he came to Fertile, where he stayed four years. He returned to Norway, attended a seminary for one year; then came back to Wisconsin and studied at a business college at Madison for two years. Following this, he edited a newspaper at Mt. Horeb for three years. He sold his interest in the newspaper and began the study of medicine at the Keokuk Medical College, Keokuk, Iowa, graduating in 1898 at the age of thirty-five.

For one year, he practiced in Kenseth, Iowa, and then moved to Fertile where he continued to practice for twenty-seven years until his death. Dr. Risjord was one of the pioneer settlers of Fertile, serving the community well as a physician. He also held the posts of mayor, council member and member of the Board of Health. He was interested in the agricultural development of that area and owned a considerable amount of farmland. Dr. Risjord became one of the outstanding citizens of his community. He was married and had four children who survived him. One son practiced in Chicago (1926) and a daughter taught school in Hibbing (1926).

John C. Rosser practiced in Fosston in 1899 and in Crookston in 1900. He was born in Lynchburg, Virginia, December 2, 1840 and was graduated from Jefferson Medical College, Philadelphia, in 1867. He served in the Civil War as surgeon and hospital steward in the 28th Texas regiment. In 1871, he settled in Brainerd and continued to practice there into the early 1880's. During the 1883 smallpox epidemic in the lumber camps of northern Minnesota, Dr. Charles N. Harth, execu-

**"Notes on Medicine in Freeborn County, 1857-1900," MINNESOTA MEDICINE, p. 76 (Jan.) 1949.

tive secretary of the State Board of Health, appointed him health officer in charge of the infected district; Dr. C. Scoboria, of Elk River, was named his assistant.** He was in Polk County around the turn of the century. In 1902 and 1904, he was listed in West Superior, Wisconsin. According to other information, he practiced in Grand Rapids from about 1895 through 1905. In 1909, he was listed without address. He was licensed in Minnesota, November 24, 1883 (Certificate No. 400). Dr. Rosser died April 25, 1914.

H. William Smith was graduated from the College of Medicine and Surgery, University of Minnesota, in 1897. Coming to Crookston soon afterward, he engaged in the practice of medicine and surgery. He did a relatively large amount of surgery, and was considered to have a high degree of skill and good judgment. He was on the staffs of both Bethesda and St. Vincent's Hospitals. He was called often by other physicians as a consultant, especially in surgical cases, where the patient might be brought later by wagon to the hospital. He employed Dr. Just as an anesthetist. Dr. Smith spent some time in hunting and fishing and was the early owner of an automobile. One such car was a high-wheeled machine supposedly able to run along in the ruts made by wagon in the mud in the Spring. Dr. Smith married Stella Monroe. When he retired from practice, he went West where he resided a few years. He died March 18, 1918. Dr. Smith was a member of the Red River Valley Medical Society, the State Medical Association and the American Medical Association.

Paul Sorkness* was listed in Fisher in 1896. He was a graduate of the College of Medicine and Surgery of the University of Minnesota, class of 1895 and he was licensed on June 11 (No. 526). In 1898, he was listed in Lake Park (Becker County). From 1903 on, he was listed in Fargo, North Dakota, but he probably came there a couple of years before, because when he died, September 23, 1920, he supposedly had practiced about twenty years in Fargo.

Dr. Sorkness was a highly respected physician and was very active in local and state medical affairs. He was at one time president of the North Dakota State Medical Association and the State Board of Medical Examiners. He was a member of the Western Surgical Association and served as local surgeon of the Northern Pacific and the Chicago, Milwaukee and St. Paul railroads. At one time, he was health officer of Fargo and Cass counties.

Albert Madison Stebbins was in Fertile in 1895, but in 1896 he was listed at both Fertile and Maplebay. He graduated from the College of Medicine and Surgery, University of Minnesota, in 1896 and was licensed October 5 of the same year (No. 478). His death occurred on July 21, 1897 while practicing in Fertile.†

Lemuel S. Stowe was listed in Crookston and Carman in 1890, but no doubt settled earlier, perhaps even in the early 80's in Crookston. He graduated from the University of Nashville, Tennessee, in 1865 and from the Vanderbilt University Medical Department, Nashville, Tennessee. In 1895 and 1898, directories listed him in Hartley (Clay County) and between 1903 and 1909, without an address.

Daniel Tufte supposedly practiced in Crookston in the early 1900's, however, very little is known about him. He graduated from the University of Christiania,

**Philip D. Jordan: *The People's Health*, pp. 200-201. Minnesota Historical Society, 1953.

**J.A.M.A.*, 75: (Oct. 30) 1920, and *Journal-Lancet* 40: (Oct. 15) 1920.

†*University of Minnesota Alumni Directory* of 1940 and *The Journal AMA*, 1897. No official record of his death could be found in Polk County or the State Department of Health.

Norway, in 1893 and was licensed in Minnesota, October 12, 1897. In 1898, he was in Nelsonville, Wisconsin, and between 1903 and 1909 he is listed in Pelican Rapids (Otter Tail County). He may have been in Fargo, North Dakota, for a while around 1905. He died in Germany, November 10, 1915.

Ernest A. Umland was listed in Fosston in 1893 and 1896. In the latter year, he and Dr. Daniel McEachran were the only legally-licensed physicians in Fosston. It seems he was in Polk County as late as 1900. Dr. Umland was licensed in Minnesota, October 12, 1883 (No. 135) but his location prior to 1893 is not known. He died in December, 1900.

Milton VanDyke graduated from Rush Medical College, Chicago, in 1880, and was licensed in Minnesota, December 31, 1883 (Certificate No. 586). He was in Crookston in 1886 or before. He was also a graduate of a pharmaceutical school and owned a drugstore in Crookston, a building which is still standing (1954). He sold his personal holdings in Crookston, including the drugstore, in 1893 and moved to Seattle, Washington, where he developed a successful practice. He continued in his profession until he died in December, 1923.

There were other medical men in Dr. VanDyke's family: Dr. Frank VanDyke, a cousin, who became chief surgeon for the Great Northern Railroad, practicing in Williston, North Dakota; Dr. John Henry VanDyke, a nephew, who practiced a short time in the hospital at Starbuck as locum tenens physician, and for a short while in the same capacity in a northern Minnesota town before moving to Long Beach, California, where he still practices (1954). Another nephew, Dr. Arthur VanDyke, practiced as dentist in St. Paul and has been St. Paul's postmaster for many years.†

James F. Warren practiced in Fisher about 1900. He had been in Sprague, Missouri, in 1896 (according to Polk's Medical Directory). Dr. Warren was not licensed in Minnesota and nothing more is known about him.

Mathew Watts practiced in Crookston from 1886 into the 1890's. He had graduated in medicine in 1878, and was mentioned in connection with the County Hospital in Crookston. He was a brother of Judge William Watts, District Judge, who also lived in Crookston. From some of the older men who remember him, the report is that he was a very conscientious, hard-working general practitioner. In 1895, he was taken ill with typhoid and died in the local hospital. However, Polk's Medical Directory listed him in Crookston as late as 1898, then without address until 1909.

William H. Welch probably was the first physician in Crookston. He is mentioned there as having reported a case of smallpox. The patient was quarantined in a newly-built pesthouse, where he apparently was well taken care of and recovered in due time. Dr. Welch graduated from the University of Vermont Medical Department, Burlington, Vermont, in 1880. He is listed in St. Hilare in 1886 and 1890; it is assumed that he moved there from Crookston. In 1927, he was listed in Larimore, North Dakota, and as late as 1934 when he was seventy-nine years old. He died May 11, 1948, at the age of eighty-nine.

†Communication from Dr. Arthur A. VanDyke, St. Paul, 1954.

Meetings and Announcements

STATE

Northern Minnesota Medical Association, annual meeting, Hibbing, Minnesota, September 6 and 7, 1957.

Southern Minnesota Medical Association, annual meeting, Lake City, Minnesota, September 9, 1957.

NATIONAL

American College of Physicians, Midwest regional meeting, Urbana, Illinois, October 12, 1957.

American Congress of Physical Medicine and Rehabilitation, thirty-fifth annual scientific and clinical session, Los Angeles, September 8-13, 1957.

American Gastroenterological Association, 59th annual meeting, Washington, D. C., May 30-31, 1958. H. M. Pollard, M.D., Secretary-General, University Hospital, Ann Arbor, Michigan.

Midwest Cardiac Conference, Iowa State University Hospitals, Iowa City, Iowa, October 3-5, 1957.

Ninth Postgraduate Assembly in Endocrinology and Metabolism, Medical College of Georgia, October 21-25, 1957.

INTERNATIONAL

Congress of International Society for Cell Biology, St. Andrews, Fife, Scotland, August 28-September 3. Prof. H. G. Callan, Bell Pettigrew Museum, The University, St. Andrews, Fife, Scotland.

Congress of International Society of Orthopedic Surgery and Traumatology, Barcelona, Spain, September 16-21. International Society of Orthopedic Surgery and Traumatology, 34 rue Montoyer, Brussels, Belgium.

Congress of International Society of Surgery, Mexico City, Mexico, October 27-November 2. Dr. L. Dejardin, 141 rue Belliard, Brussels, Belgium.

Fifth International Congress of Internal Medicine, Philadelphia, Pennsylvania, April 24-26, 1958. Edward R. Loveland, Secretary-General, 4200 Pine Street, Philadelphia 4, Pennsylvania.

Inter-American Congress of Pan American Medical Association, Mexico City, Mexico, November 18-22. Dr. Joseph J. Eller, 745 Fifth Avenue, New York 22, New York.

International Conference of Ultrasonics in Medicine, Statler Hotel, Los Angeles, California, September 6-7, 1957. John H. Aldes, M.D., Secretary, 4833 Fountain Avenue, Los Angeles 20, California.

Pan-Pacific Surgical Association, Seventh Congress, Honolulu, Hawaii, November 14-22, 1957. Dr. F. J.

Pinkerton, Director General, Pan-Pacific Surgical Association, Room 230, Young Building, Honolulu, Hawaii.

World Congress of Gastroenterology, Washington, D. C., May 25-31, 1958. H. M. Pollard, M.D., Secretary-General, University Hospital, Ann Arbor, Michigan.

UROLOGY AWARD

The American Urological Association is offering an annual award of \$1,000 for essays on the result of some clinical or laboratory research in urology. First prize is \$500, second prize \$300, and third prize \$200. Competition is limited to urologists who have been graduated not more than ten years, and to hospital interns and residents doing research in urology. The first prize essay will appear on the program of the meeting of the American Urological Association to be held at the Roosevelt Hotel, New Orleans, Louisiana, April 28-May 1, 1958.

Full information may be obtained from William P. Didusch, Executive Secretary, American Urological Association, 1120 North Charles Street, Baltimore, Maryland. The deadline for essays is December 1, 1957.

OLIVIA GIRL WINS 1956 AAPS ESSAY CONTEST

Miss Sonia Gustavson, eighteen-year-old Olivia, Minnesota, girl, received a first prize award of \$1,000 in the 1957 national essay contest sponsored by the Association of American Physicians and Surgeons Freedom Programs, Inc. This was the eleventh annual national contest and Miss Gustavson's topic was "The Advantages of Private Medical Care." She was presented with her award at the commencement exercises of the Olivian High School on May 29. The day also happened to be her birthday. Miss Gustavson plans to begin her course in pre-medicine at the University of Minnesota this fall.

The national essay winner was sponsored by the Renville-Redwood County Medical Society, with Dr. J. A. Cosgriff, Olivia, in charge. An interesting sidelight is the fact that Dr. Cosgriff delivered Sonia eighteen years ago.

The Renville-Redwood Society presented Miss Gustavson with \$15.00 for first prize within the society and gave a \$10.00 second prize and a \$5.00 third prize.

Miss Gustavson was present at the annual banquet of the Minnesota Academy of General Practice, Monday, May 13, and was introduced to the group by Dr. Cosgriff.

The 1958 essay contest will be sponsored by the Minnesota State Medical Association as a result of action of the House of Delegates at the 104th annual meeting.

Woman's Auxiliary

NEW OFFICERS ELECTED

Mrs. C. L. Oppegaard, Crookston, was installed as president of the Woman's Auxiliary to the Minnesota State Medical Association for the year 1956-57 at the thirty-fifth annual meeting held May 13-15 in St. Paul. Mrs. Reuben Erickson, Minneapolis, was elected president-elect. Other new officers include Mrs. M. F. Fellows, Duluth, first vice president; Mrs. Harold Peterson, St. Paul, second vice president; Mrs. J. A. Cosgriff, Olivia, third vice president; Mrs. J. A. Bargen, Rochester, fourth vice president; Mrs. Stanley Peterson, Austin, recording secretary; Mrs. John Cameron, Crookston, corresponding secretary; Mrs. Gilman Goehrs, St. Cloud, treasurer; Mrs. G. E. Penn, Mankato, auditor; Mrs. Philip Arzt, St. Paul, historian, and Mrs. Leo W. Fink, Minneapolis, parliamentarian.

Dr. Wallace E. Anderson, Clearbrook, Dr. J. A. Bargen, Rochester, Dr. O. J. Campbell, Minneapolis, Dr. A. O. Swenson, Duluth and Mr. R. R. Rosell, St. Paul, make up the medical advisory council.

Regional advisers include: Mrs. Howard F. Polley, Rochester, first district; Mrs. David Halpern, Brewster, second district; Mrs. M. I. Hauge, Clarkfield, third district; Mrs. Alton E. Lindblom, North Mankato, fourth district; Mrs. W. P. Gardner, St. Paul, fifth district; Mrs. Arthur N. Russeth, Minneapolis, sixth district; Mrs. Leslie Evans, Sauk Rapids, seventh district; Mrs. Robert Estrem, Fergus Falls, eighth district and Mrs. Andrew Sinamark, Hibbing, ninth district.

The advisory committee includes Mrs. H. H. Fesler, St. Paul; Mrs. Peter Rudie, Duluth; Mrs. L. P. Howell, Rochester; Mrs. C. L. Sheedy, Austin, and Mrs. H. F. Wahlquist, Minneapolis.

Committee chairmen and national officers will be announced in next month's issue.

Nearly 300 women attended the 1957 meeting sessions which were held at the Hotel Lowry. A vote of thanks is extended to the Ramsey County Medical Auxiliary, the hostess group, for an outstanding meeting. Mrs. W. P. Gardner and Mrs. W. P. Ritchie were in charge of general arrangements.

On Monday morning the group toured the Minnesota Mining research center. The executive board meeting and luncheon were also held on Monday and highlighting the day's activities was a lovely tea at the home of Dr. and Mrs. Philemon Roy, North Oaks.

The annual meeting and annual luncheon were held on Tuesday. Schuneman's presented a style show at the luncheon.

On Wednesday morning, the Ramsey County Auxiliary entertained all visiting women at a breakfast in the Hotel Lowry Ramsey Room.

Contributions for this column, including news and activities of State Auxiliary societies and items of interest about members, may be sent to Mrs. A. B. Rosenfield, Woman's Auxiliary Editor, MINNESOTA MEDICINE, 2920 Dean Boulevard, Minneapolis, Minnesota.

NEWS FROM THE COUNTY AUXILIARIES

Hennepin

Mrs. Karl Anderson, Linwood, Lake Minnetonka, is the newly elected president of the Hennepin County Auxiliary. Other new officers are Mrs. Hamlin Mattson, Mrs. Karl Sandt, Mrs. O. L. N. Nelson, Mrs. Elmer Hill, Mrs. Harold Noran, Mrs. Robert Quello, Mrs. Conrad Holmberg, Mrs. Edward T. Evans and Mrs. Sumner Cohen.

Lyon-Lincoln

Members of the Lyon-Lincoln County Medical Society entertained their wives at a clinical meeting and banquet held at the Atlantic Hotel in Marshall in May. Dr. Dorothy Sunberg, of the University of Minnesota, spoke on "Blood."

Wabasha

Dr. and Mrs. William Gjerde, Lake City, opened their home to wives of doctors attending the South-eastern Minnesota General Practitioners course held in Lake City recently. An evening banquet was given for the doctors and their wives after which the wives adjourned to the Gjerde home.

Zumbro Valley

The Zumbro Valley Auxiliary held its annual Health Day program in May at the Mayo Foundation House in Rochester. Tea was served, followed by the program which included the film "Three to Make Ready" and a report on the Southern Minnesota Ability Building Center by Dr. Frank H. Krusen and David Griggs, managing director of the center.

All Rochester club women were invited to attend this meeting.

PHARMACOLOGY FOR THE FAMILY PHYSICIAN

(Continued from Page 490)

meprobamate or Miltown is characteristic of addiction. From that standpoint we have to watch patients taking these drugs most carefully.

These drugs produce some tendency to sleep, which isn't always desirable. What can one do about it? It is possible to add a central nervous system stimulant and keep the individual a bit more awake during the daytime. Amphetamine or Benzedrine in doses of one or two milligrams may be used. A similarly acting drug is Ritalin,[®] the beginning dose being five to ten milligrams. The third drug is Maratran in one to two milligram doses. These, if used, should be used in the morning or early afternoon, never in the evening, because they might prevent sleep. These seem to be of benefit. Whether this will tend to cancel out the action of the ataractic drugs, only the future can tell.

In Memoriam

HENRY M. LEE

Word has just been received of the death of Dr. Henry M. Lee, Cambridge, Minnesota, in 1956. He was sixty-six years old.

A former Minneapolis surgeon, Dr. Lee left the city in 1950. He received his education at Rush Medical College and had his offices in Minneapolis in the Medical Arts Building for many years.

A former member of the Hennepin County Medical Society, he also belonged to the East Central Minnesota Medical Society, the Minnesota State Medical Association and the American Medical Association.

WILLIAM PAUL OLSON

Dr. William P. Olson, retired Gaylord, Minnesota, physician, died at his home in Los Angeles, California, April 16, 1957. He was seventy years old.

Born in Iowa, Dr. Olson graduated from the University of Minnesota Medical School in 1909 and interned at Ancker Hospital, St. Paul. After practicing in Lafayette, Minnesota, for three years, he moved to Gaylord. He owned and operated the Gaylord Hospital from 1920 to 1938, when he retired and moved to Westwood Village in Los Angeles.

Dr. Olson had been a member of the Camp Release Medical Society, the Minnesota State Medical Association and the American Medical Association. He served as health officer for Gaylord, as Sibley County health officer and county coroner for many years. He was a member of the I.O.O.F. lodge, the Masonic lodge, local fire department and many other local civic organizations.

He is survived by his widow, Grace; one daughter, Mrs. William Paulson, Santa Monica, California; one son, Dr. Duane Olson, Gaylord, and three grandsons.

WILLIAM B. ROBERTS

Dr. William B. Roberts, Minneapolis physician since 1902 and head of Scottish Rite Masons in Minnesota for the past twelve years, died May 8, 1957, at his home. He was eighty-one years old.

Since 1925, Dr. Roberts had been sovereign grand inspector general of Minnesota Masons. He also was a life member of Zuhrah Temple of the Shrine, a member of Joppa Blue Lodge and first chairman of the group which organized the Minneapolis DeMolay chapter in 1915. He was the ranking 33rd degree Mason in the state. The degree was conferred in 1925 in Washington.

Born at Lacon, Illinois, he was the son of the late Dr. George F. Roberts who practiced medicine in Minneapolis from 1882 to 1914.

Dr. William Roberts received his education at the University of Minnesota and Hahnemann Medical School in Philadelphia, Pennsylvania. At the age of fifty-two, he took postgraduate work in Europe. During World War I he served in the medical department of the U. S. Navy. He closed his medical office in Minneapolis in March, 1956, but continued to practice on a limited

basis. He was a member of the Hennepin County Medical Society, the Minnesota State Medical Association and the American Medical Association. He became a member of the "Fifty Club" group of the State Medical Association in 1952.

Surviving are his wife, Elizabeth; a son, George F., Roswell, New Mexico; a daughter, Mrs. Francis P. Whiting, Minneapolis; seven grandchildren and one great-grandson.

ALCOHOLISM IN INDUSTRY

(Continued from Page 511)

be capable of benefiting from the AA program. For those patients requiring a longer period of treatment, including hospitalization, the physician would do well to be familiar with the excellent resources available for this purpose in Minnesota. The Willmar and Sandstone state hospitals provide long-term care for alcoholics who are received on a voluntary basis or through court commitment. Pioneer House, a treatment center located at Medicine Lake, is operated by the City of Minneapolis. The Hazelden Foundation operates a private, non-profit, treatment center at Center City for men alcoholics and a similar center at White Bear Lake for women alcoholics.

The alcoholic is often unco-operative, and treatment may be difficult. If an alcoholic gets drunk after much time and effort has been spent with him, the situation can be discouraging. For the physician who intends to work with alcoholics, it is important to remember that the alcoholic is as sick as other patients and requires understanding care.

PATRICK BUTLER, *Chairman
Minnesota Advisory Board
on Problems of Alcoholism*

HEALTH PROBLEMS OF AMERICAN INDIANS

Health problems of the American Indians are discussed in an article published in the July issue of *Public Health Reports*. Based on a survey of health needs of the Indians recently completed by the Public Health Service for Congress, the article defines obstacles to improvement of Indian health and identifies measures which offer promise of more rapid progress.

The article, entitled "Health Services for American Indians," is by George St. J. Perrott and Margaret D. West, survey director and associate director, respectively. Mr. Perrott is chief of the Service's Division of Public Health Methods, and Mrs. West is head of the Health Services Requirements Branch of that division.

General Interest

Dr. M. W. Comfort, member of the staff of the Mayo Clinic, was installed as president of the American Gastroenterological Association on May 19 at Colorado Springs, Colorado. The president-elect of the Association is a former Mayo Clinic staff member, Dr. Clifford J. Barborka, Chicago.

* * *

A lectureship in chest disease, sponsored by the St. Louis County Christmas Seal organization for the St. Louis County Medical Society, has been established in honor of Dr. Arthur T. Laird, Duluth, retired superintendent and medical director of Nopeming Sanatorium, who has been associated with tuberculosis control work in the United States for half a century.

* * *

The Minnesota Academy of General Practice presented its award of merit in May to Dr. Aaron Friedell, Minneapolis.

* * *

On May 10 the National Tuberculosis Association, at its annual meeting in Kansas City, Missouri, named Dr. Mario Fischer, Duluth and St. Louis County director of public health, as its president-elect. Dr. Fischer has previously served as vice president and director of NTA.

* * *

Dr. Ray R. Knight, Minneapolis, was one of two "Town Toppers" sketched in the *Minneapolis Star*, May 15.

* * *

Dr. Edgar V. Allen, senior consultant in medicine at the Mayo Clinic and president of the American Heart Association, addressed the annual meeting of the South Dakota Heart Association at Rapid City, June 1.

* * *

Dr. William C. Bernstein, St. Paul, recently delivered the annual Levin Memorial Lecture at Louisiana State Medical School in New Orleans, sponsored by the American College of Gastroenterology. Dr. Bernstein's subject was "The Detection of Early Lesions of the Large Intestine."

* * *

The only complete museum honoring the late Dr. Walter Reed, conqueror of yellow fever, will be set up at the Mayo Clinic, Rochester. Dr. Philip Hench, staff member of the Clinic, has devoted seventeen years to research into the work done by Reed in Cuba and is the sole source of authentic records on Dr. Reed's activities. The museum will be set up in a room at the New Clinic library.

* * *

The American Board of Plastic Surgery elected Dr. Frederick A. Figi, senior consultant in plastic surgery at the Mayo Clinic, to a one-year term as chairman on May 8.

The Minnesota Society of Internal Medicine held its annual spring meeting at Red Wing, Saturday, May 25. The speaker at the evening dinner was Mrs. Eugenie Anderson, Red Wing, former ambassador to Denmark, whose subject was "From the Front Lines of Freedom." Dr. Walter Neff, Virginia, is president of the group.

* * *

Dr. Fred W. Wittich, Minneapolis, president emeritus of The American College of Allergists, and editor, *Review of Allergy and Applied Immunology*, conducted a scientific exhibit on "Vascular Headaches" at the Section on Internal Medicine of the American Medical Association, held at the Coliseum, New York, June 3-7.

* * *

On June 3, 1957, Dr. C. W. Mayo, head of a section of surgery in the Mayo Clinic and professor of surgery, Mayo Foundation, Graduate School, University of Minnesota, was awarded the honorary degree of doctor of laws by Drake University, Des Moines, Iowa. Dr. Mayo delivered the commencement address at Drake, speaking on "Educational Responsibilities."

* * *

The Minnesota Chapter of Alpha Omega Alpha, honorary medical society, at its annual meeting in May elected Dr. J. S. Blumenthal faculty president. Dr. Blumenthal is clinical associate professor of medicine and director of the Allergy Clinic, Department of Internal Medicine, University of Minnesota Hospitals.

* * *

Dr. Edward M. LaFond, St. Cloud, has been appointed recently as city physician and health officer, succeeding Dr. William Autrey. Dr. LaFond, who is a specialist in orthopedics, has been practicing medicine in St. Cloud for a year and a half.

* * *

Dr. Robert F. Schnabel, Omaha, Nebraska, has recently joined the staff of Northwestern Clinic, Crookston, as pediatrician. Dr. Schnabel received his medical degree from the Medical College of Virginia, at Richmond, Virginia, and received special training in pediatrics at the Raymond Blank Memorial Hospital for Children in Des Moines, Iowa.

* * *

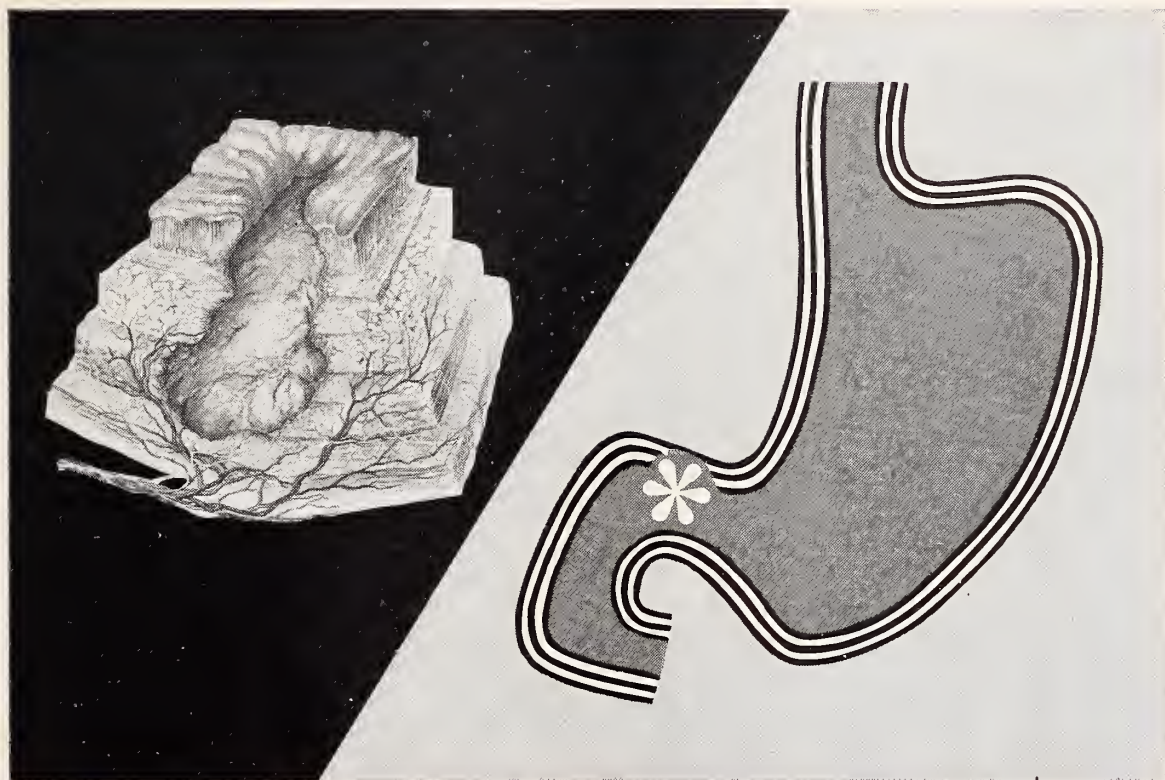
Dr. Ralph Nyhus joined the staff of the Mesaba Clinic, Hibbing, on June 1. Dr. Nyhus, a pediatrician, took his internship in pediatrics at the University of Minnesota hospitals, and has completed a three-year fellowship in pediatrics at the Mayo Clinic. He is certified by the American Board of Pediatrics.

* * *

The American College of Chest Surgeons presented its distinguished service medal on June 1 to Dr. William H. Feldman, experimental pathologist of the Mayo Clinic and Mayo Foundation. The award, which is

(Continued on Page A-30)

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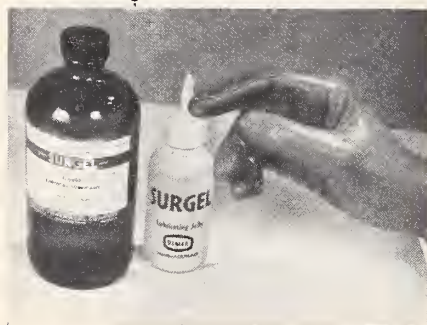
cholinergic blockade consist, as many clinical investigators have noted, in prompt relief of ulcer pain and pronounced acceleration of ulcer healing.

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(Continued from Page 530)

given annually to the person contributing most to advancement in cardiopulmonary disease, was made Dr. Feldman for his extensive laboratory studies the chemotherapy of tuberculosis.

* * *

Dr. Ralph R. Rayner has given up his practice Glencoe for a four-year surgical residence at Ancker Hospital, St. Paul.

* * *

May 31 was designated "Doctor Sutton Day" at Hoffman, Minnesota, so that the community could express its appreciation to Dr. H. R. Sutton for his thirty-eight years of medical practice. Dr. Sutton has served the Hoffman area since 1921.

* * *

Dr. J. Arnold Bargen, member of the staff of the Mayo Clinic, was recently added to the advisory board of the *Minneapolis Tribune's* Minnesota Poll.

* * *

A comprehensive leaflet on the venereal diseases, the first especially designed for young people, has been published by the American Social Hygiene Association. Entitled "Some Questions and Answers About VD," the new pamphlet outlines symptoms, causes, and treatment for syphilis and gonorrhea in simple factual language. The leaflet is free in single copies, and is available \$1.00 per 100 in quantity orders. It may be obtained from the Publications Department, American Social Hygiene Association, 1790 Broadway, New York 1, New York.

* * *

Dr. E. W. Arnold, Adrian, celebrated his seventieth birthday on May 1. He is still engaged in active practice after fifty years as a physician and surgeon and has served Adrian and the surrounding community since 1917.

* * *

On May 22, the board of trustees of Fairview Hospital, Minneapolis, honored seventeen physicians who have been members of the staff for twenty-five years or more. Drs. C. Alford Fjelstad, Henry Lysne, and Leon J. Petit have been staff members continuously since 1916 when the hospital began operations. Other doctors honored were Melvin Baken, Richard Dorg, Joseph Giere, Richard Giere, Raymond Hawkins, Gjert Kelby, Harold Leland, Lawrence Leonard, John Moe, E. Gerhard Oppen, Arthur Skjold, Lloyd Steltz, Nora Winther, and Julius Johnson.

* * *

The degree of Doctor of the Humanities was presented to Dr. J. M. Waugh, Mayo Clinic, at commencement exercises at Tarkio College, Missouri, during May. Dr. Waugh, as commencement speaker, spoke on "The Obligations of the Privileged."

* * *

On Friday, May 24, Dr. E. J. Huenekens, Minneapolis pediatrician, was given the third annual F. J. Harrington award for outstanding service to public health. The award, sponsored by the Minneapolis Junior

Member of Commerce, was presented at the concluding dinner of the Upper Midwest Hospital Conference in Minneapolis. The presentation was made by **Dr. S. Marx White**, recipient of last year's award. Since 1948 Dr. Huenekens has been chief of staff of the Elizabeth Kenny Institute.

* * *

The Hektoen gold medal of the American Medical Association was awarded at the AMA annual meeting in New York, June 5, to a group of University of Minnesota surgeons for their exhibit showing their pioneering work in open-heart surgery. Recipients of the award were **Drs. C. Walton Lillehei, Herbert E. Harken, Richard A. DeWall, Vincent L. Gott, Robert J. Sellers, Norley Cohen** (formerly at the University), **C. C. Read, Richard L. Varco**, and **Owen Wangenstein**.

* * *

Dr. John S. Lundy, of the Section of Anesthesiology at the Mayo Clinic, and professor of anesthesiology in the Mayo Foundation, visited Fort Benjamin Harrison Army Hospital, Indianapolis, on June 3, in his capacity as consultant to the surgeon of the Fifth Army. This was the sixth such visit Dr. Lundy has made as army consultant.

* * *

On June 10, Carleton College presented one of its Alumni Achievement Awards to **Dr. Arthur B. Hunt**, head of a Section of Obstetrics and Gynecology at the Mayo Clinic, for his "outstanding success in the field of medicine and service to the college and the alumni." Dr. Hunt, who is a 1925 graduate of Carleton, is president of the Central Association of Obstetricians and Gynecologists.

* * *

The University of Virginia chapter of Phi Beta Kappa recently elected **Dr. Bayard T. Horton**, consultant in medicine at the Mayo Clinic, an honorary member in recognition of his researches in medicine. Dr. Horton received his medical degree from the University of Virginia in 1922.

* * *

Governor Orville Freeman has recently announced the appointment of three Minnesota physicians to terms on various state boards and commissions. **Dr. Harry R. Clark** of St. Cloud has been appointed to serve on the state college board as resident director from the St. Cloud area. **Dr. Frederick J. Kottke**, Minneapolis, has been appointed for a third three-year term on the Minnesota physical therapy committee. **Dr. Cyril M. Smith** of Duluth, St. Louis county coroner and for twelve years a member of the state athletic commission, was reappointed for a three-year term expiring March 1, 1960.

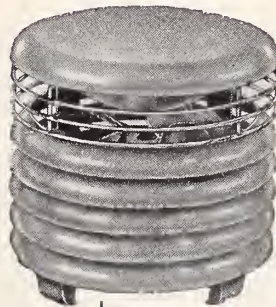
* * *

The American Society of Maxillofacial Surgeons held its two-day annual meeting at the Leamington Hotel in Minneapolis recently. Membership in the society is restricted to physicians who have both medical and dental degrees plus plastic surgery training; there are only fifty-four active members. **Dr. Samuel G. Balkin**, Minneapolis, was elected national president,

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GENERAL INTEREST

and Dr. Carl H. Waldron, Minneapolis, is one of eight senior members and one of two recipients of the society's "special honorary award."

* * *

Dr. Jere W. Annis, a native of Minneapolis, was elected president-elect of the Florida Medical Association at its recent convention in Hollywood, Florida. Dr. Annis graduated from the University of Minnesota Medical School in 1935. He interned at the Minneapolis General Hospital and was a fellow in internal medicine at the Mayo Foundation.

* * *

Dr. George Martin, Thief River Falls, and Dr. A. M. Jensen, Brownton, attended a course in electrocardiography held at the University of Minnesota Center for Continuation Study in May.

* * *

Dr. M. D. Starekow, Thief River Falls, was guest speaker at a recent Rotary Club meeting at the local Elks Club. He discussed recent developments in the field of medical research.

* * *

Dr. Floyd D. MacLean, professor of surgery at the University of Minnesota, spoke on "Bacterial Shock—An Experimental Study" at a recent meeting of the St. Paul Surgical Society.

* * *

Thomas E. Keys, Mayo Clinic librarian, has been elected president of the Medical Library Association.

Dr. E. G. Wakefield, chairman of the library committee of the Mayo Clinic, was elected an honorary vice president of the organization at the 56th annual meeting of the organization held in New York City, May.

* * *

Dr. Byron Armstrong, Minneapolis dermatologist, now on the staff of the Mankato Clinic. He is still maintaining his office in Hopkins.

* * *

Drs. Robert Brandenberg and Philip E. Bernhardt, Rochester, spoke at a recent meeting of the Bemis Lutheran Hospital staff. They discussed the diagnosis of heart and artery disease with special reference to the possibility of surgical aid. They presented similar material at a recent medical meeting held in Valley City, N. D.

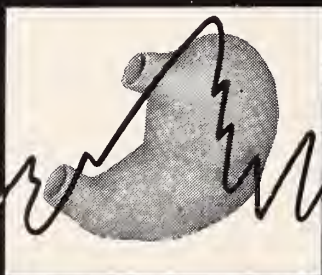
* * *

Dr. Kathleen B. Jordan, Granite Falls, spoke at "Tuberculosis Today" at the Brown County accreditation ceremony held in New Ulm in May.

* * *

Lake City physicians entertained the Southeastern Minnesota general practitioners at the quarterly symposium course and banquet held recently at the Terrace Club. Dr. William Gjerde, president of the group, presided over the sessions which were attended by about fifty persons. Speakers included Drs. George Kimball and Winston Miller, both of Red Wing, and Drs. Irwin

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SEARLE

aiser and Frederick Von Bergen of the University of Minnesota.

A banquet was given for all doctors and their wives attending, and the wives were entertained in the evening at the home of Dr. and Mrs. Gjerde.

* * *

Dr. Edward Senn, Owatonna, was honored as a 50-year member of the Masonic Lodge recently.

* * *

Dr. John Grasse, Jr., formerly of Albuquerque, New Mexico, has joined the staff of the Warren Clinic as an associate with Drs. C. H. Holmstrom and E. E. Smala.

* * *

Dr. Robert Rosenthal, St. Paul, spoke on "Medicine and Shakespeare" at the annual dinner meeting of the Southern Minnesota chapter of the National Association of Society Workers, medical social work section.

* * *

Members of the Lyon-Lincoln County Medical Society held their clinical meeting at the Atlantic Hotel in Marshall recently. Dr. Dorothy Sunberg of the University of Minnesota was one of the principal speakers.

* * *

Dr. Frederick Kottke, University of Minnesota, spoke at a recent meeting of the Southwestern Minnesota Medical Society held in Worthington.

* * *

The Range Medical Society and the Range Bar Association held a medical-legal seminar recently at the Androy Hotel in Hibbing. Judge Christ Holm, Hibbing, was moderator for the panel discussion, and Eugene E. Bangs, Chisholm attorney, was chairman of the event.

Attorney John Trenti and Dr. E. N. Peterson, Virginia, spoke on "Histories and Examinations Before Trials"; Eugene E. Bangs and Dr. Clarence Jacobson, Chisholm, discussed "Medico-legal Aspects Before Trial"; Attorney Thomas J. Carey, Virginia, and Dr. W. W. Johnsrud, Hibbing, spoke on "The Medical Witness in Court," and Attorney James Abate, Hibbing, and Dr. McLemore Bouchelle, Virginia, discussed "Medical Fees."

* * *

Dr. Edward Evans, Edina, delivered the 22nd annual John W. Bell Tuberculosis Lecture in the auditorium of the North American Life and Casualty Company in Minneapolis recently. The lecture was co-sponsored by the Hennepin County Medical Society and the Hennepin County Tuberculosis Association. Dr. Evans' topic was "Present Concepts in the Treatment of Osseous Tuberculosis."

* * *

Dr. Joyce S. Lewis has been named director of the Hamm Memorial Psychiatric Clinic to succeed Dr. Clarence J. Rowe, who resigned to enter private practice. Dr. Rowe has also accepted an assignment as a psychiatric consultant at the clinic, thus filling a post which has been open for some time.

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Minnesota Blue Shield paid physicians \$2,837,171 during the first four months of 1957 for 99,509 services to participant subscribers. These figures represent increases of approximately 28 per cent and 30 per cent, respectively, over the amount, \$2,215,225, and the number of services 76,204, paid by Blue Shield the first four months of 1956.

Blue Shield payments to physicians for subscribers' benefits during the first four months of 1957 are equal to average monthly payments of \$709,293 and exceed by \$621,946 the total amount of claims paid by Blue Shield for the same four months in 1956.

Participant subscribers with Minnesota Blue Shield numbered 837,565 as of April 30, 1957 compared with 753,910 participant subscribers enrolled as of the same date in 1956. During the twelve months prior to April 30, 1957, the number of participant subscribers increased 83,655 or approximately 11 per cent.

While it is apparent that the number of Blue Shield subscribers increased substantially from April 30, 1956, to April 30, 1957, it is equally apparent that the enrollment increase alone does not account for the great increases in the number of services paid by Blue Shield or the total amount paid during the first four months of 1957 as compared with the same four months of 1956.

During the first four months of 1957, Minnesota Blue Cross payments to hospitals amounted to \$9,367,111.89, an increase of \$1,700,589.58 compared to the \$7,666,522.31 paid to hospitals during the same period of the preceding year.

This increase in hospital payments is attributable not only to increased enrollment, but also to the continuing trend of higher level of Blue Cross contractual benefits which have been adopted by Blue Cross members.

Blue Cross participant subscribers totaled 1,111,141 as of April 30, 1957, an increase of 67,503, as compared to 1,043,637, Minnesotans enrolled in Blue Cross as of April 30, 1956.

During the first four months of 1957, 417,797.6 days of hospital care were provided for 67,239 participant subscribers compared to 374,167.2 days provided for 60,421 participant subscribers during the comparable period of 1956. Although the average length of hospital stay remained at 6.2 days per case, usage increased 3.6 per cent from 468 to 485 cases paid per year per 1,000 contracts protected.

This increase was divided fairly evenly between surgical and medical care with obstetrical cases showing no increase in incidence rate.

Accident cases showed the greatest single increase in incidence: 1,500 more cases paid representing six more cases paid per year per 1,000 contracts.

THE THYROID

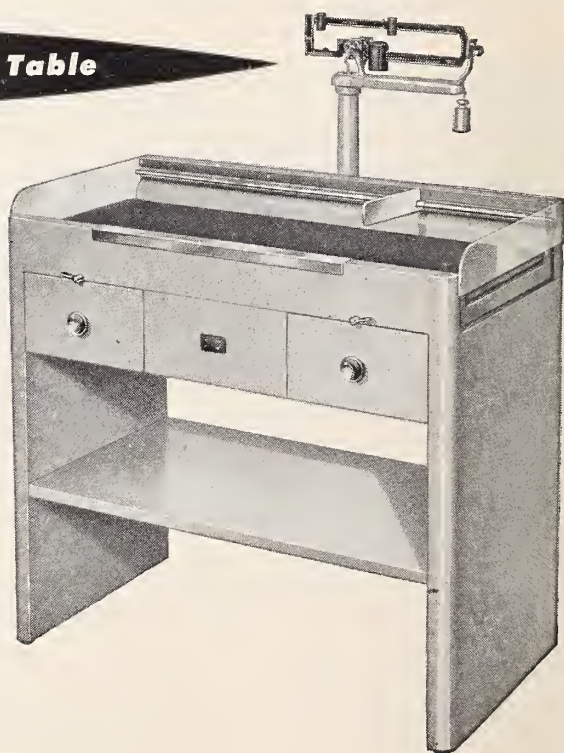
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Book Reviews

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

PRACTITIONERS' CONFERENCES. Held at the New York Hospital-Cornell Medical Center. Volume 5. Edited by Claude E. Forkner, M.D., F.A.C.P. Professor of Clinical Medicine, Cornell University Medical College; Attending Physician, New York Hospital; Consultant in Medicine (Hematology) Roosevelt Hospital; Consultant in Internal Medicine, Bronx Veterans Administration Hospital. 378 pages. Illus. Price \$6.75, cloth. New York: Appleton-Century-Crofts, Inc., 1957.

ALCOHOLISM. A Treatment Guide for General Practitioners. Donald W. Hewitt, M.D., Chief Medical Advisor, Charity Alcoholic Rehabilitation Center, Los Angeles, California. 112 pages. Price \$3.00, cloth. Philadelphia: Lea & Febiger, 1957.

MANAGEMENT OF THE PATIENT WITH HEADACHE. Perry S. MacNeal, M.D., F.A.C.P., Physician to Pennsylvania Hospital and Benjamin Franklin Clinic, Philadelphia; Assistant Professor of Clinical Medicine, Jefferson Medical College; Bernard J. Albers, M.D., Sc.D. (Med), F.A.C.P. Professor and Head of Department of Neurology, Jefferson Medical College; Consulting Neurologist to Benjamin Franklin Clinic of Pennsylvania Hospital, Philadelphia, and

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William R. O'Brien, M.D., F.A.P.A. Psychiatrist a
 Head of Department of Psychiatry, Pennsylvania H
 pital; Associate Physician to the Benjamin Frank
 Clinic of the Pennsylvania Hospital; Instructor
 Psychiatry, Jefferson Medical College. 145 pag
 Price \$3.50, cloth. Philadelphia: Lea & Febiger, 19

SURGERY IN WORLD WAR II. Orthopedic Surge
 in the Mediterranean Theater of Operations. Editor
 Chief, Colonel John Boyd Coates, Jr., M.C.; Editor
 Orthopedic Surgery, Mather Cleveland, M.D.; As
 ciate Editor, Elizabeth M. McFetridge, M.D. 3
 pages. Illus. Price \$4.00, cloth. Washington, D. C
 U. S. Government Printing Office, 1957.

VEGETABLE OILS IN NUTRITION with Spec
 Reference to Unsaturated Fatty Acids. Dorothy
 Rathmann, Ph.D. Multiple Fellowship of Corn Pro
 ducts Refining Company Mellon Institute, Pittsburg
 70 pages. Illus. Cloth Bound. New York: Co
 Products Refining Company, 1957.

A TEXT BOOK OF PATHOLOGY. By E. T. Be
 M.D., Emeritus Professor of Pathology in the Unive
 sity of Minnesota. Contributors: B. J. Clawse
 Emeritus Professor of Pathology in the University
 Minnesota and J. S. McCartney, Professor of Patholo
 in the University of Minnesota. 8th ed. 1028 pag
 Illus. Price \$14.50. Philadelphia: Lea & Febig
 1956.

The eighth edition of "Text Book of Pathology"
 E. T. Bell, M.D., continues to be one of the best te
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Original Contributions

Clinical Variations in Cystic Fibrosis of the Pancreas

BURTON FEINERMAN, M.D.
EDMUND C. BURKE, M.D.
Rochester, Minnesota

GR^EAT variation occurs in the clinical manifestations of cystic fibrosis of the pancreas. Recent studies of patients with this disease suggest that it is a generalized condition in which all exocrine glands are affected.¹⁻³ The purpose of this paper is to discuss the unusual clinical picture seen in some of these patients.

Table I lists the significant clinical and laboratory findings in the forty-four patients, whose ages ranged from three months to fourteen years when first seen at the clinic. Table II illustrates the variations in signs, symptoms and results of laboratory studies in six of these patients.

The following four cases are reported in detail because of their unusual clinical manifestations.

Report of Cases

Case 1.—A four-year-old girl was brought to the clinic because of respiratory distress and generalized anasarca. The child had been premature at birth, weighing 4 pounds, 10 ounces. She was dismissed from the hospital at one month of age, with a weight of 5 pounds. Cough and difficulty in breathing appeared when she was seven weeks of age. A diagnosis of pneumonia was made, and she was hospitalized for three weeks. Her gain in weight was poor. Pneumonia developed again at the age of six months; she was treated for several weeks at another hospital, where a diagnosis of cystic fibrosis of the pancreas was made. She was dismissed, with the advice to continue maintenance doses of antibiotics and pancreatic granules. When she was one year of age, it was first noted that her stools were large and foul-smelling. At two years, she became weak, listless and dehydrated during a heat wave and required administration of fluids and electrolytes. She continued to have frequent upper respiratory infections.

Seven months prior to admission, generalized edema developed and then disappeared within three days after treatment by the family physician. She had three similar

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attacks after this, which responded to medical management. One week prior to admission, anasarca again developed and did not respond to therapy. She became dyspneic, orthopneic and oliguric. The family history revealed that a male sibling had died at eight months of age from cystic fibrosis of the pancreas.

On admission to the clinic, the child was in acute respiratory distress. The temperature was 99° F., the pulse rate was 120 beats per minute and the respiratory rate was 70. Pitting edema of the legs and arms and the abdominal and thoracic walls was present, with considerable ascites. Moist rales were audible at the bases of both lungs. The second pulmonic heart sound was accentuated, and a friction rub was heard over the left parasternal border in the fourth intercostal space. Clubbing of the fingers and toes was present.

A thoracic roentgenogram revealed diffuse congestion in both lungs and cardiac enlargement. An electrocardiogram disclosed right ventricular hypertrophy (systolic overload type of pattern) and cor pulmonale. Blood studies showed the following values (in milliequivalents per liter): sodium, 138; potassium, 4.2; chlorides, 97; and carbon dioxide, 28. Despite administration of antibiotics, acetazoleamide (Diamox) and a cardiac glycoside (Digoxin), the patient died twelve hours after admission.

Necropsy revealed cystic fibrosis of the pancreas, congestion and fibrosis in both lungs, and cardiac enlargement, particularly of the right ventricle.

Case 2.—A three-year-old boy was admitted because of persistent fever, cough, rash and pains in the joints. At seven months of age, he had been hospitalized elsewhere because of anorexia, poor gain in weight, and large, foul-smelling stools. A diagnosis of cystic fibrosis of the pancreas was made. Pneumonia developed when he was two years old and he received antibiotics. Intermittent bouts of fever, cough, generalized rash and pains in the knees and elbows began seven months prior to admission. These symptoms persisted until his admission.

Examination at the clinic revealed a poorly developed, poorly nourished, twenty-six-pound child with some muscular wasting and a protuberant abdomen. Cervical, axillary and inguinal lymph nodes were palpable; they were discrete, nontender and freely movable. A fine papular rash was present over the trunk, face and legs, and small erythematous lesions were noted over the

knees and elbows. Petechiae were found on the legs. Tenderness was present on palpation and motion of the knees. A barrel-shaped thorax was noted. The liver was palpable 3 cm. below the costal margin, and the spleen was palpable 2 cm. below this margin.

A thoracic roentgenogram showed increased broncho-vascular markings bilaterally. Duodenal drainage revealed an absence of trypsin, lipase and diastase. Culture of the throat showed an abundance of *Micrococcus pyogenes*; results of blood culture were negative. The value for hemoglobin was 12 gm. per 100 ml. of blood. Leukocytes numbered 6,100 per cubic millimeter of blood, with the following distribution: lymphocytes, 5 per cent; monocytes, 8 per cent; segmented neutrophils, 44 per cent; band neutrophils, 23 per cent; basophils, 1 per cent; metamyelocytes, 2 per cent; late myelocytes, 3 per cent; early myelocytes, 2 per cent; progranulocytes, 1 per cent; and blast cells, 11 per cent. Platelets were reduced to 26,000 cells per cubic millimeter of blood. The Quick prothrombin time was 22 seconds (normal, 17 to 19 seconds); the coagulation time was 4 minutes and the bleeding time 6 minutes. The bone marrow contained many stem cells, some with large nucleoli, others with nucleoli of varying size; a large number of cells were differentiating into reticular mononuclear cells. Some plasma cells were seen, but only an occasional immature megakaryocyte was noted. Opinion was divided as to whether the picture was that of a reactive bone marrow secondary to some toxic agent or of leukemia. He was dismissed, with a plan for follow-up studies in the near future. Melena, hematuria and bleeding from the gums appeared one month later, and he was admitted to a hospital near his home. Examination at that time revealed generalized lymphadenopathy, hepatosplenomegaly and ascites. Rales were heard posteriorly at the base of the left lung. Study of the blood revealed significant changes. The hemoglobin now measured 5.5 gm. The leukocyte count was 127,000, with 28 per cent segmented neutrophils, 24 per cent nonsegmented neutrophils, 7 per cent metamyelocytes, 8 per cent myelocytes, 1 per cent promyelocytes, 1 per cent basophils, 8 per cent monocytes, 18 per cent lymphocytes and 5 per cent blast cells. A diagnosis of leukemia was made. Despite treatment with cortisone, blood transfusions and antibiotics, the child died two months later.

Necropsy done elsewhere disclosed leukemic infiltration in the lungs, liver, gallbladder, esophagus, stomach and intestines. Purulent material was noted in the bronchi. The parenchyma of the pancreas was almost completely gone, with only ducts, islets and dense connective tissue remaining, the whole being infiltrated with leukemic cells.

Case 3.—A nine-month-old girl who had been diagnosed previously at the clinic as having cystic fibrosis of the pancreas was admitted because of vomiting and dehydration. The patient had a history of foul-smelling stools since two months of age and recurrent infections of the respiratory tract since the age of three weeks. One sibling had died of cystic fibrosis of the pancreas.

During a heat wave, she became greatly dehydrated

over a period of two days. Her appetite became poor and she vomited most of her feedings. On admission, she appeared poorly nourished (weight, 9 pounds) and dehydrated, with sunken eyes, dry tongue and lips, and poor cutaneous turgor. Sternal retraction was present, and moist rales were heard at the bases of both lungs. The abdomen was protuberant.

A thoracic roentgenogram revealed patchy pneumonitis in both lung fields. *M. pyogenes* and *Pseudomonas* organisms were cultured from the throat. The value for blood urea was 36 mg. per 100 ml. Chlorides measured 86 mEq. per liter, and the carbon dioxide was 38 mEq. The infant died despite intravenous administration of fluids, later feedings through a polyethylene tube and large doses of antibiotics.

Necropsy revealed cystic fibrosis of the pancreas and suppurative pneumonitis.

Case 4.—A seven-year-old boy was admitted because of dyspnea and cough. At the age of three years, he had had pneumonia and since that time had experienced repeated infections of the respiratory tract. A cough developed that became progressively worse and produced thick, sticky, yellowish-green sputum. His stools were normal. He tolerated exercise poorly and was dyspneic at rest.

On admission to the clinic, the boy appeared chronically ill. Clubbing and cyanosis of the fingers and toes were evident. His thorax was barrel-shaped, and rales were heard at the bases of both lungs.

A thoracic roentgenogram disclosed a diffuse inflammatory process in both lung fields, particularly in the lower portions, suggestive of bronchiectasis. The serum proteins were normal. Studies of sputum were negative for fungi but showed an abundance of *M. pyogenes* and *Hemophilus influenzae*. Results of tuberculin tests were negative. Study of material obtained by duodenal drainage revealed the following concentrations: trypsin, 2 ml. of N/10 sodium hydroxide; diastase, 1.4 gm. of maltose; lipase, 80 ml. of N/20 sodium hydroxide. Study of sweat showed that it contained 150 mEq. of chlorides per liter. Electrocardiography disclosed right ventricular hypertrophy. Despite the presence of duodenal enzymes, a diagnosis of cystic fibrosis of the pancreas was made because of the prominent pulmonary findings and the abnormal chemical composition of the sweat.

Comment

Case 1 was unusual because of the extreme generalized edema. The vast majority of patients who have cystic fibrosis of the pancreas have values for serum protein that are within the normal range. It is extremely rare for these patients to have hypoproteinemia severe enough to produce edema. May⁴ stated that a patient who has both cystic fibrosis of the pancreas and edema most likely has cor pulmonale or cirrhosis of liver as a complicating factor. It has been estimated that about a third of patients with cystic fibrosis have

signs of cardiac failure before death.⁵ A direct relationship apparently exists between the degree of right-heart strain and the severity of pulmonary involvement. Children with this disease should be studied electrocardiographically to determine the degree of right ventricular hypertrophy, which is important in evaluating prognosis. Infants who show signs of failure of the right side of the heart may respond to therapeutic measures early in their management. Eventually, however, the cardiac failure becomes irreversible, and the patients become resistant to diuretics and digitalis.

The unusual association of leukemia with cystic fibrosis of the pancreas was present in Case 2. This patient also illustrated the fact that, despite characteristic signs and symptoms of leukemia, blood studies early in the disease may not be diagnostic.

Management of patients with cystic fibrosis during warm weather can offer many problems, as seen in Case 3. This is particularly true when fluid is lost by vomiting or diarrhea, in addition to the electrolytes excreted in abnormal amounts in the sweat. Gochberg and Cooke⁶ recently demonstrated that an abnormally high concentration of sodium chloride occurs in the sweat of patients who have cystic fibrosis. In their study, the concentration of sodium in the sweat of such patients averaged 79 mEq. per liter, while the average concentration in controls was 18 mEq. Obviously, therefore, the patient who has cystic fibrosis is in grave danger of depletion of salt and water during stress from high environmental temperatures. Maintenance of fluid and electrolytic balance by means of parenteral therapy is necessary. Even with the most vigorous type of treatment, these patients may not respond, as in Case 3. Children who have electrolytic imbalance out of proportion to the degree of fluid lost by vomiting or diarrhea should be suspected of having cystic fibrosis of the pancreas.

Pancreatic function in this disease may be normal or only slightly reduced.^{2,3} Respiratory involvement may be the most conspicuous factor in some instances, as in Case 4; other patients have signs of pancreatic insufficiency but almost no respiratory symptoms, and the only abnormal finding in some may be increased concentration of electrolytes in the sweat. It has been estimated that 10 to 15 per cent of patients with cystic fibrosis of the pancreas have little or no deficiency of pancreatic enzymes.³ An infant with meconium

TABLE I. DATA IN 44 PATIENTS WITH CYSTIC FIBROSIS OF THE PANCREAS

Findings	Cases
Sex distribution	
Boys	20
Girls	24
First symptoms	
Gastrointestinal	26
Respiratory	20
Normal thoracic roentgenogram	7
Duodenal enzymes	
Absent	35
Partial deficiency	5
Normal	2
Not determined (diagnosis at necropsy)	2
Abnormal electrocardiogram	5
Normal nutritional status	3
Bronchiectasis	5
Associated disease	
Leukemia	1
Ventricular septal defect	1

ileus and only partial pancreatic insufficiency has been described in the literature. The degree of pulmonary involvement is the most important factor in determining prognosis in cystic fibrosis of the pancreas. A number of patients with minimal pulmonary disease have lived beyond fifteen years of age.⁷

The first symptoms were gastrointestinal in nature (such as foul-smelling, bulky stools) in twenty-six of the forty-four patients studied at the clinic (Table I); the remaining eighteen patients had respiratory difficulties as the earliest complaints. Of the forty-two patients who had duodenal drainage, only one had normal pancreatic function and five had partial function. Seven patients had normal thoracic roentgenograms. The commonest organisms obtained on culture of the throat and sputum were *M. pyogenes*, *H. influenzae*, *Pseudomonas* and pneumococci.

In Table II it is noted that two patients (Cases 7 and 8) had good nutritional status and yet both had no duodenal enzymes; signs of chronic respiratory disease also were present in Case 8. Evidence of pancreatic and pulmonary insufficiency was noted in Case 9, yet some duodenal enzymes were present. Case 6 represents the so-called classic picture of cystic fibrosis of the pancreas. The only important finding in Case 5 was the abnormal composition of the sweat.

Pathogenesis

Many theories have been considered in regard to the pathogenesis of cystic fibrosis of the pancreas. Such ideas as a deficiency of vitamin A,⁸ a common embryologic origin of the anlagen of the lung and pancreas,⁹ deficiency of secretin,¹⁰ and congenital stenosis or atresia of the pancreatic

ductal system^{11,12} have been discarded as additional knowledge of the disease became available. Farber¹³ offered the concept of "generalized mucoviscidosis," with inspissation of material in the

effective treatment can be instituted. At the present time, there are no medical or surgical measures that will alter the ultimate course of the disease. Since the degree of pulmonary change is

TABLE II. CLINICAL VARIATIONS IN CYSTIC FIBROSIS OF THE PANCREAS

Case	Age, Years	Duration of Symptoms		Nutrition	Weight, Pounds	Physical Findings	Thoracic Roentgenogram	Duodenal Enzymes*	Chlorides in Sweat, mEq./liter
		Gastro-intestinal	Respiratory						
4†	7½	None	4 years	Poor	44	Emphysema, clubbing, rales	Diffuse inflammatory process; bronchiectasis	Trypsin, 2; diastase, 1.4; lipase, 80	150
5	1	1 month	2 months	Fair	19	Lungs clear, abdomen slightly protuberant	Normal	Trypsin, 1.3; diastase, absent; lipase, 56	111
6	3	6 weeks	2 months	Poor	22	Rales, clubbing	Bilateral pneumonitis	Trypsin, absent; diastase, absent; lipase, absent	265
7	¾	5 months	1 month	Good	21	Wheezes in thorax, no rales	Normal	Trypsin, absent; diastase, absent; lipase, absent	120
8	3	27 months	1 year	Good	36	Rales, protuberant abdomen, clubbing	Bilateral pneumonitis	Trypsin, absent; diastase, absent; lipase, absent	131
9	1½	2 weeks	4 weeks	Poor	18	Rales, protuberant abdomen	Bilateral pneumonitis	Trypsin, 1.4; diastase, absent; lipase, 16	111

*Trypsin = ml. of N/10 NaOH; diastase = gm. of maltose; lipase = ml. of N/20 NaOH.

†Detailed discussion in text.

lumina of mucus-secreting organs, plugging of the pancreatic acini and ducts, and obstruction in the trachea and bronchi caused by thick mucus.

The present knowledge that the sweat and salivary glands are involved in cystic fibrosis of the pancreas suggests that all exocrine glands, mucus-producing and others, are affected in the disease. Another hypothesis is that some alteration may occur in the enzymes involved in the production of mucoprotein, which causes an abnormally thick, viscid mucus to be formed.¹⁴ To account for the generalized disease process in cystic fibrosis of the pancreas, several authors have suggested the possibility of generalized dysfunction of the autonomic nervous system.¹⁵⁻¹⁹

Treatment

Further understanding of the pathogenesis of cystic fibrosis of the pancreas is necessary before

the most important factor in prognosis, treatment should be aimed primarily in this direction. An outline of the recommended therapeutic measures includes the following:

1. The diet should be high in calories, with large amounts of protein and simple sugars, such as glucose, and small amounts of fats.

2. Pancreatic extract (pancreatin) should be given with each meal.

3. Antibiotics should be used after the performance of sensitivity tests on organisms obtained on culture of the throat and sputum. Many patients have received penicillin and the tetracyclines for long periods and may harbor organisms resistant to these antibiotics. The use of such preparations as bacitracin, polymixin and cathomycin may aid when resistant strains have developed. Aerosolization of the antibiotics is the most effective

tive method of administration. Aerosolized antibiotics may be particularly effective when combined with a mixture of streptokinase and streptodornase (varidase) and hyaluronidase (alidase). One combination is 2 units of alidase plus 20 ml. of varidase; this, with the antibiotic, may be given as an aerosol in a DeVilbiss No. 40 nebulizer, using 5 ml. of solution for fifteen minutes three times a day. Antibiotics also may be combined with a dilute solution of benzalkonium (Zephiran) chloride for aerosolization.

4. Postural drainage should follow aerosolization three times a day.

5. The use of bronchograms in this disease is contraindicated. Surgical procedures on the lung rarely are indicated because of the generalized pulmonary involvement.

Summary

A study has been made at the Mayo Clinic of forty-four patients who had cystic fibrosis of the pancreas. Four unusual cases are described in detail. A four-year-old girl with cystic fibrosis of the pancreas was admitted because of generalized edema and died from acute cor pulmonale; a three-year-old boy had the unusual association of leukemia and cystic fibrosis of the pancreas; a nine-month-old infant with cystic fibrosis died during a heat wave; a seven-year-old boy had only the pulmonary manifestations of cystic fibrosis of the pancreas, with normal pancreatic function.

These cases emphasize the great variation that exists in the clinical manifestations of cystic fibrosis of the pancreas. Recent studies suggest that the disease is a generalized condition in which all exocrine glands are affected.

The pathogenesis of this disease remains obscure. The extent of pulmonary involvement is the most important factor in the prognosis. Specific treatment is not available at present, but such measures as diet, use of pancreatin, postural drainage and use of aerosolized antibiotics are of some aid.

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Determining the Activity of Pulmonary Tuberculosis

Reliability of History, Physical Examination, and Routine Office Laboratory Procedures

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THE HISTORY, physical examination, and routine office laboratory procedures may prove seriously inadequate in evaluating the patient with an abnormal chest film. By reviewing 203 cases of minimal and moderately advanced pulmonary tuberculosis we would like to emphasize this possibility and suggest the frequency with which it may occur.

Material

Our material consisted of 203 cases of active pulmonary tuberculosis selected from the patients and files of the Minneapolis Veterans Administration Hospital and Glen Lake Sanatorium, Oak Terrace, Minnesota.

Criteria

1. All cases showed demonstrable activity either on the basis of positive bacteriology or by change noted in serial roentgenograms.
2. Only cases with pulmonary tuberculosis were considered; cases with pleural effusion, known extra-pulmonary tuberculosis, and patients who had previous surgical procedures altering the roentgen picture were excluded as were patients with concurrent diseases such as carcinoma, rheumatoid arthritis and pregnancy.
3. Cases were included only if all data were available including initial laboratory data and concomitant chest roentgenogram—all antedating any therapy.
4. The classification of stage of disease followed the NTA standards as outlined in the 1955 edition.¹ Two observers reviewed all films.

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Cases compatible with the above criteria were studied from the aspect of symptoms,* physical findings,** review of initial chest film plus planigrams when available, WBC and differential, ESR (abnormal 20 mm/hr or more) and comparison of initial and subsequent bacteriology. Initial bacteriology consisted of three Ziehl-Nielsen stained sputum smears (direct or concentrated specimens). Subsequently positive bacteriology consisted of later smears and positive culture.

TABLE I. SOURCE OF CASES—PULMONARY TUBERCULOSIS

	MINIMAL		MODERATELY ADVANCED	
	Hospitalized	Discharged	Hospitalized	Discharged
Mpls. V.A. Hospital	14	29	26	18
Glen Lake Sanatorium	16	37	57	6

Results

Of ninety-six cases of active minimal tuberculosis, 71 per cent were asymptomatic, 71 per cent had no physical findings, 85 per cent had a normal ESR, 93 per cent had negative initial bacteriology and 23 per cent remained bacteriologically negative. Sixty per cent of these patients would have been judged inactive if dismissed when first seen. Only by culture of sputum, or more often gastric contents, or by means of serial films was activity proved.

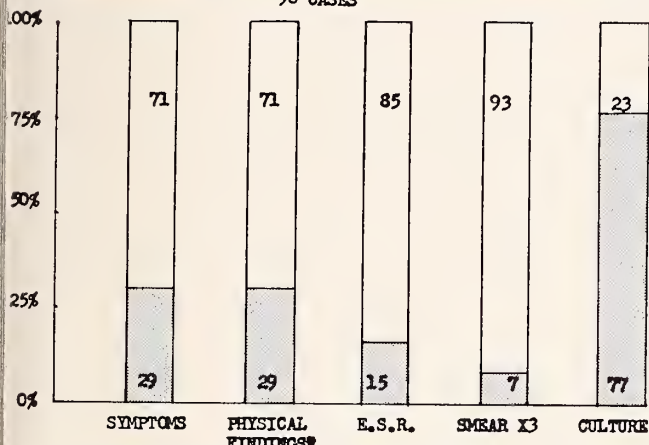
Of 107 cases of active moderately advanced disease 38 per cent were asymptomatic, 48 per cent had no physical findings, 42 per cent had a

*Symptoms studied included chest pain, cough, hemoptysis, sweats, fever, anorexia and/or weight loss.
**Physical findings studied included rales, rub, dullness and/or weight loss.

normal ESR, and only 23 per cent had positive initial bacteriology. Cavitory disease was present in 75 per cent. Seventy-three per cent with this feature had negative sputum smears.

INDICATIONS OF ACTIVITY IN MINIMAL PULMONARY TUBERCULOSIS

96 CASES

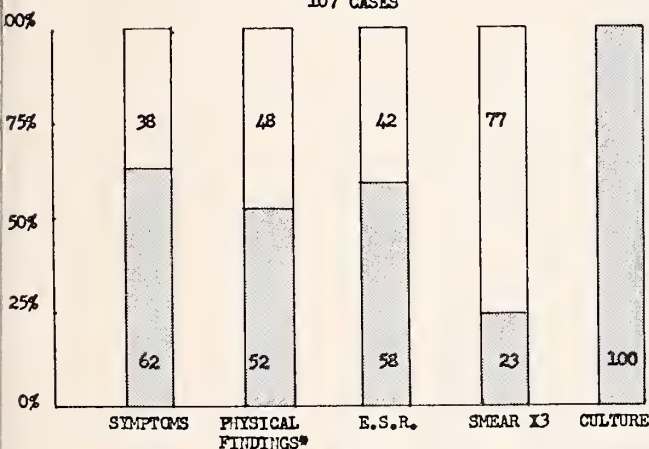


* Physical findings reported in 82 of 96 cases.

Fig. 1.

INDICATIONS OF ACTIVITY IN MODERATELY ADVANCED PULMONARY TUBERCULOSIS

107 CASES



* physical findings reported in 81 of 107 cases.

Fig. 2.

Figs. 1 and 2. Shaded areas indicate present, abnormal or positive findings. Clear areas indicate absent, normal or negative findings.

Of the moderately advanced cases 16 per cent would have been judged inactive by a "routine work-up."

Forty-four cases of far-advanced tuberculosis seen at the Minneapolis Veterans Administration Hospital demonstrated 100 per cent activity at least one sign of activity being initially present in each patient. This suggests that the more severe the disease the easier the diagnosis.

Discussion

At this juncture some comment should be made on skin testing. It is perhaps the most valuable screening test available due to its specificity.

SPUTUM STATUS IN CAVITARY DISEASE - 107 CASES (MODERATELY ADVANCED)

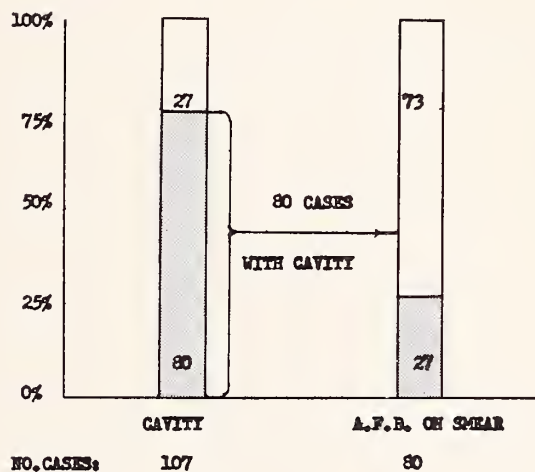


Fig. 3.

SYMPTOMS, PHYSICAL SIGNS, E.S.R. AND SPUTUM SMEARS (ANY OR ALL PRESENT)

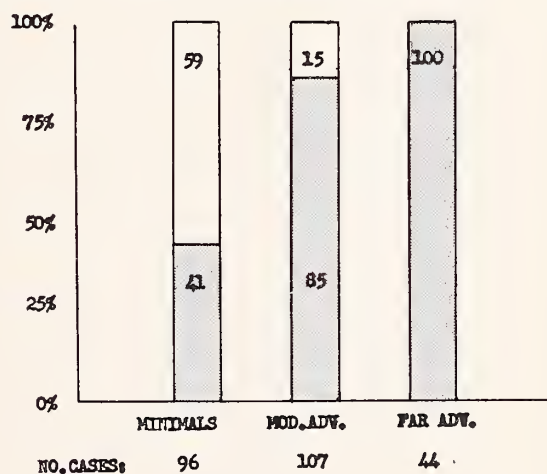


Fig. 4.

Figs. 3 and 4. Shaded areas indicate present, abnormal or positive findings. Clear areas indicate absent, normal or negative findings.

Although not diagnostic of active disease, it is of particular value in a population where the incidence of tuberculosis is low or if in an individual the date of conversion is known. Under these circumstances it should alert the physician to the possibility of active disease. With one exception our group was Mantoux positive, bacteria being recovered from this exception.

Our study revealed that over 70 per cent of

the minimal group and almost 40 per cent of the moderately advanced group were asymptomatic. This is not a unique finding. Although the concept of tuberculosis has changed markedly in the past twenty years, the following observation is perhaps still pertinent. Chadwick² in 1933 reported that in 1,500 sanatoria patients an average of ten months elapsed between the onset of vague symptoms and eventual diagnosis and hospitalization. Tsai³ states that in a group of 100 patients with minimal lesions hospitalized at Glen Lake between 1936 and 1948 symptoms were either absent, minimal or hard to evaluate. In this group the presence of hemoptysis in nine patients was the most specific complaint. It then behooves one to question a patient carefully but not to rule out tuberculosis on the basis of negative answers.

As has already been pointed out, the presence of positive physical findings is not appreciably higher than the incidence of symptoms. Morgan and Chadwick² reviewed 2,828 chest films looking for possible tuberculosis. In seventy-nine of 440 x-ray-positive patients, there were no auscultatory findings, eighty-four had decreased breath sounds, as did 271 x-ray negative patients. Of the 440 x-ray positive group 277 had rales, whereas only twenty-five x-ray-negative patients had this finding. It was our experience in this study that, when the examination was performed by a more experienced clinician, positive findings were more frequently noted.

Although the WBC and differential may be helpful in excluding an acute inflammatory process from the differential diagnosis, we found it to be of little direct aid in the diagnosis of tuberculosis. Rich⁴ agrees that there is no characteristic blood picture of diagnostic or prognostic aid in this disease.

It was our experience that the ESR was normal in the majority of minimal cases and in almost one-half the moderately advanced cases. This suggests that the ESR also has limitations in establishing the diagnosis and activity of pulmonary tuberculosis. Westergren⁵ in 1920 suggested the relation of "the suspension stability of the erythrocyte as an index to the activity of pulmonary tuberculosis, specifically, as a diagnostic and prognostic tool superior to temperature studies." Surprisingly, he used as a base line a rather limited group, drawing from the Royal

Navy (Swedish) twelve sailors who were healthy, twenty-three men who were neither ill nor healthy, and thirty-nine men with evident disease. Comparing sixty patients from the Soderby Sanatorium, Stockholm, with this control group he concluded that elevation of the SR (ESR) and the activity of the disease were well correlated. He qualified this by stating that "in cases where normal values are obtained, notwithstanding the diagnosis of pulmonary tuberculosis, it is a benign process." A further qualification was that "at the early diagnosis of tuberculosis the SR must be cautiously determined." In the years that have followed the technique has been popularized, subjected to many revisions and used extensively as a clinical guide. However, Weichsel⁶ in 1924 felt that the value of the ESR had been overestimated. He reported that patients with clear-cut x-ray evidence of disease and positive clinical findings might have a normal ESR, occasionally even in the presence of cavitory disease. Kirby⁷ summarizes contemporary views on the subject stating that the ESR is normal in the majority of patients with minimal disease and that it may be deceptive—being normal in the face of extensive intrabronchial disease and excessively high in the face of a mild pleural reaction.

Our study also re-emphasizes the fact that examination of sputum smears does not constitute an adequate bacteriologic study. Bacteriologic proof of tuberculosis is in large part proportional to the intensity with which it is pursued. Decker⁸ reports that culture of gastric washings yielded positive results in forty-one of fifty-six sputum-negative patients. Needham⁹ reports that at the Mayo Clinic in 1952, 34 per cent of the cultures disclosing *M. tuberculosis* were obtained from material negative on microscopic examination. Kirby and Tsai both stress repeated attempt at culture. The former reports five to fourteen negative cultures before the first positive culture was obtained; the later reports over twice as many positives when six or more gastric studies were done.

Tuberculosis though often classic in roentgen appearance may mimic either a neoplasm or an acute inflammatory process. In our review it was found that a single chest film at best could only suggest the nature and extent of the disease. The exact nature could be determined only by review of serial films. In this regard the value of comparing the present film with any

previous films cannot be overemphasized. Further knowledge regarding the nature and exact extent may be obtained by means of planigraphy. This latter process is of great value in the consideration of cavitory disease.

Edwards et al¹⁰ cite the problems of interpretation of minimal tuberculosis encountered in their review of 7,906 army rejectees followed through the New York City Department of Health. Initial and follow-up films were read in 4,079 cases. It was found that, when these films were read independently, there was such a difference of opinion in the interpretation of the approximately 50 per cent of the films that overlapped that it was necessary to publish two sets of data. The chief discrepancy lay in the interpretation of the nature of the disease. In attempting to evaluate the nature of the process, lesions were classed as exudative, intermediate and fibro-calcific. It was found that the prognosis was most accurately gauged at the extremes. Reissner¹¹, in a review of 469 cases from the Ambulatory Chest Clinic of the New York City Department of Health studied over a five-year-period, concluded that in minimal tuberculosis the chest film provides the most objective criterion for evaluation of the clinical status.

Holman¹² has very excellently reviewed the value of the chest roentgenogram, summarizing its uses and limitations. Specifically, the chest film can locate the lesions and suggest its nature, but only by means of serial films can the activity of the disease be determined.

Summary and Conclusions

The admission, clinical, and laboratory data as well as pertinent subsequent data needed to demonstrate activity were reviewed in ninety-six cases of minimal tuberculosis and 107 cases of moderately advanced pulmonary tuberculosis. The following conclusions were reached:

1. The history, physical examination and most routine office laboratory procedures do not constitute an adequate study of the patient presenting an abnormal chest roentgenogram.
2. Repeated attempts to obtain positive bacteriology by culture technique plus the study of serial films will increase the frequency with which activity may be established.

As Carr¹³ has pointed out, the chief role of the

physician is to have a high index of suspicion which will lead him to study each patient individually and thoroughly.

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NEW TB VACCINE

Clinical trials with a promising new tuberculosis vaccine made from human tubercle bacilli killed by irradiation are reported by Dr. Armando Pareja Coronel of Guayaquil, Ecuador, where trials were conducted among 100 children born of parents with tuberculosis.

Of the 100 infants vaccinated, seventy-one have returned to their homes from the hospital and no evidence of active tuberculosis has been discovered. The vaccine was well tolerated and no local reactions were observed, the author states.—*The American Review of Tuberculosis and Pulmonary Diseases*, 75:987 (June) 1957.

Encephalopathies following DPT Inoculations and Pertussis

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IN 1948, Byers and Moll reported fifteen pediatric cases of encephalopathy following the use of pertussis prophylactic vaccine. The children so studied were from five to eighteen months of age at the time of their affliction with this disease. To all known, these children were of normal intelligence at the time they received pertussis vaccine, and subsequent to inoculation developed the neurologic disturbances which were reported by these two clinicians. In only three of these children was there any family history of neurologic disturbance elicited. In one case, two of three siblings had seizures, and there was an hydrocephalic sibling, and in the third case a younger sibling suffered from febrile seizures. In the evaluation of the material used, there were twelve inoculated with fluid toxoid of the pertussis only; there were two children who had received combined diphtheria-pertussis vaccine (one fluid, and one alum-precipitated); and one child received DPT vaccine, alum precipitated. The sequence of injections did not seem of significance; six cases developed their seizures with the first injection, three with the second, and six with the third. The interval between injection and first neurologic symptoms, usually seizures, varied from twenty minutes to seventy-two hours, and the convulsions, from a few minutes to several days. They varied from mild to severe convulsions and the sensorium changes ranged from irritability to frank coma.

During the acute illness there were six cases seen in the hospital, five showing increased spinal fluid cell counts and with increased total proteins in these cases, ranging from normal to 86 mg per cent. The eyegrounds were normal in all six cases. Two other cases were seen by other clinicians in their acute illnesses and the cell count of the spinal fluid was elevated in only one of these (63 monocytes/cc). Of the fifteen cases, mental fol-

lowup tests showed mild retardation in two, progressive retardation with death in one, eight with moderately severe retardation, and three cases with gross mental deficiency, one of whom subsequently died. Four infants appeared to be mentally normal four to fourteen months after the acute illness, giving approximately 75 per cent retardation in this group of children. Further followup of the four infants who seemed intact may yet show more subtle changes.

Neurologically, thirteen of the fifteen children studied showed persistent convulsions over several years' time. One was eventually felt to have recovered completely, two went progressively downhill and died, nine had severe cerebral damage and had to be considered permanently incapable of competitive living, and three were as yet not followed a sufficient time to determine the final outcome. Eight patients had pneumoencephalograms, six of which showed dilations of the lateral ventricles. The outcome of the electroencephalograms done on ten patients showed six having slow activity with two showing wave and spike discharges and two showing spike foci. No electroencephalograms were obtained on the two patients who died of pneumonia. It is of interest that, while eleven of these children had recurrent seizures, only three of these were cases of cerebral palsy; three others had cerebral palsy without convulsions. Two were also blind; two died; and one was considered normal. This points up a very high incidence of seizures and retardation, but a surprisingly low rate of organic cerebral palsy.

Of a series of twenty-six children suffering encephalopathy due to pertussis over the same period of time, seven died with the acute illness, ten were permanently retarded, six were apparently normal, and three could not be located for followup; this would also attest to the great danger of the disease, as well as the inoculations, in producing encephalopathy. Only three of this

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TABLE I

Case	Age at Time of Injection	Sex	No. of Shots	Shot-Reaction Interval	Material
M.R.	7 months	M	2	3 hours	DPT
C.G.	7 months	F	1	4 hours	DPT
D.N.	6 months	M	1	12 hours	DPT
E.H.	7 months	M	1	18 hours	DPT
I.M.	10 months	M	2	4 hours	DPT

TABLE II

Case	Severity of Acute Disease	Birth History	Family History of Seizures	Febrile Seizures in Patient
M.R.	Severe	76-hour hard labor—full term	Paternal uncle retarded	0
C.G.	Severe	Normal—term	0	0
D.N.	Severe	Normal—term	0	0
E.H.	Severe	56-hour hard labor, ? birth injury	0	0
I.M.	Severe	Normal—term	0	0

group had recurrent convulsions, perhaps as a result of the high mortality. Studies by other observers up to the time of the article by Byers and Moll would certainly not lead one to expect such a dismal outcome.

Transient, nonrecurrent convulsions were reported by Doull² in three of 496 children given fluid toxoid pertussis vaccine; Taylor³ reported one episode (nonrecurrent) in a ten-month-old child following an injection of fluid toxoid pertussis vaccine. Kentrick and Eldering⁴ reported only one convulsion following pertussis vaccine inoculation in 1,815 children given a total of 9,075 injections. Sako⁵ reported only two transient seizures in 6,000 injections of alum-precipitated vaccine; in 105,000 children immunized to pertussis he was able to locate only four cases of convulsions.

Case Material

With the foregoing material already on record, it would seem of value to report the findings of a series of five cases of encephalopathy following the use of DPT vaccine and five cases of encephalopathy attendant to the disease of pertussis itself. These cases represent the turnover of a five-year survey at the University of Minnesota Hospitals, Department of Pediatrics. These cases have been selected only by virtue of their disease, and represent the entire group of such cases in the period of time. They were all subjected to a standard convulsive workup, including blood sugars, calcium, phosphorous, blood urea nitrogen, skull x-rays, electroencephalograms, and, in several cases, pneumoencephalograms. The results of these

TABLE III

Case	Type of Seizure	Pneumoencephalogram	Electroencephalogram
M.R.	Grand mal with mental retardation	Mild frontal atrophy at age of nine months.	Diffusely abnormal with generalized slow high voltage waves, frontal spikes, and spike-wave discharges
C.G.	Generalized tonic and left focal (arm, leg, face)	Normal at 4 years and 10 months.	Diffusely abnormal with generalized slow, hi-voltage waves of 1-1½ per second frequency
D.N.	Diffuse tonic and myoclonic	Normal at 3 years and one month	Normal record obscured by diffusely scattered slow, hi-voltage waves.
E.H.	Grand mal with aura of pain in abdomen	None done	Normal
I.M.	Tonic-clonic, diffuse, mild	None done	Diffusely abnormal with 2-4/sec. hi-voltage slow waves and wave/spike abnormalities in all areas

studies and the conclusions drawn from them follow.

Analysis of Cases Due to Vaccination

Five cases of encephalopathy followed the use of alum-precipitated triple vaccine (DPT). All the patients in this group were under eight months of age. There were four boys and one girl. There seemed to be no definite likelihood of any one injection in the series causing encephalopathy any more than any other. Three had their reaction after the first injection and two followed the second injection. All of the cases developed their fateful reactions within twenty hours after the specific injection. They were almost uniformly accompanied by temperatures of 103 degrees rectally, or higher. The reaction then proceeded to the convulsive state within varying periods of time. It is of interest that none of these children had had febrile seizures prior to this, a fact which would tend to suggest that these reactions were not in the nature of a fever convulsion (Table II).

All of these children had major convulsive phenomena of the grand mal type; one had a focal left-sided seizure and one had additional components of petit mal attacks (Table III).

In only one case was there a family history of either febrile or epileptic seizures. This boy (M. R.) had a paternal uncle who had seizures and was retarded.

A review of the birth histories revealed three apparently normal deliveries at term, one hard, fifty-six-hour labor, in which the local physician stated that the baby was in such bad shape that

TABLE IV

Case	Age at Time of Follow-up	Interval Since Reaction	Neurological Status		
			Cerebral Palsy Seizures		Change in Mentality
M.R.	26 months	19 months	C.P.	Yes	—
C.G.	98 months	92 months	0	Yes	—
D.N.	26 months	32 months	0	Yes	—
E.H.	65 months	71 months	0	Yes	—
I.M.	38 months	28 months	0	No	†

† = normal, — = retarded.

TABLE VI

Case	Age at Time of Pertussis	Pertussis-Seizure Interval	Previous Pertussis Immunization
J.E.	8 years	6 months	0
D.P.	2½ years	acute disease	0
T.S.	1½ years	one year	0
A.H.	4 years, 1 mo.	acute illness	0
R.B.	8 years	2 months	DPT vaccination (3 shots)

he was not expected to live. Despite all these factors, however, all of these children were considered by their parents to have progressed normally, up to the time of the disease following their pertussis vaccinations.

Electroencephalograms were done on all five of these children at the time of their initial hospital study with the results seen in Table III. In brief, abnormal records were all characterized by marked slowing to the 1½-4/sec. activity with marked increases in voltage. These findings were generalized, and in three cases there were wave and spike complexes similar to a petit mal variant. Only one case (E. H.) had a normal electroencephalogram (Table III).

Pneumoencephalograms were done in three of the five cases. Two were reported as normal and one showed atrophy of the frontal regions of the brain (Table III).

The treatment of these patients was primarily anticonvulsant and, in general, the most valuable drugs were found to be Mysoline and Mebaral in combination; in one instance, Mebaral was satisfactory alone, and in one instance Mebaral and Dilantin were used without Mysoline (Table V). In three instances there were marked reduction of seizures, but in two cases no form of therapy was able to produce any notable improvement. Three patients were recommended for state hospital placement because of retardation and one was put in a special class at school. Only one patient of the five is at present judged to be normal in followups after the initial disease varying from nineteen to seventy-one months (Table

TABLE V

Case	Trend of Seizures (Good or Bad)	Clinical Problems	Best Seizure Medications	Prognosis
M.R.	Bad—little improvement	Delayed speech slow development	Mysoline Mebaral	Poor
C.G.	Bad—cyclic remissions	Delayed, thick speech, obvious progressive deterioration	Mysoline Mebroin	Poor
D.N.	Bad—cyclic remissions but generally frequent	Slowing some, is probably slow	Mebroin	Guarded
E.H.	Good	Initially dull, now is normal to all signs	Mysoline Mebroin	Fair
I.M.	Good	None	Mebaral	Good

IV). In general, then, the prognosis for these children was very poor as far as normal life and job expectancy is concerned.

Analysis of Cases following Pertussis Infection

In the same five-year period as the preceding cases, there were also five cases of pertussis with accompanying encephalopathy and convulsions. These children formed an older age group and the seizure disorder was as severe or more so in the pertussis cases as in the vaccine cases. The age at onset varied from one and one half to eight years; the interval between the acute illness and evidence of convulsions or encephalopathy varied from six months to one year. In only one case was there any previous history of any prophylactic pertussis vaccine given, and in this case the boy had had three injections in the first year of life of alum-precipitated DPT (Table VI). Electroencephalographic studies on the first hospital study showed three diffusely abnormal tracings with two normal tracings. As in the vaccine cases, they showed marked slowing and, in certain areas, wave-and-spike complexes could be found (Table VII).

A study of the seizures revealed that all these children also had major motor seizures, and in four out of five cases these were very severe. Despite this, however, on therapy, two of these children stopped having seizures, and the other three showed marked improvement (Table VII).

Followups were made from one and one half to nine and one half years after the initial encephalopathy (Table VIII), and it was found that three children still had seizures although much improved; three were definitely mentally retarded in

TABLE VII

Case	Type Seizure	Intensity	EEG Reading	PEG	Subsequent Course
J.E.	Major motor diffuse	Severe but infrequent	Diff. Abn. and rt. centroparietal focus	0	Seizures stopped in 6 years, with medication now discontinued.
D.P.	Major motor and left sided focal	Markedly severe and frequent	Diffusely abnormal slow, high voltage	0	Seizures stopped at age 10 years, medication discontinued at 9 years after first seizure, 6 years after starting.
T.S.	Tonic, general	Severe	Normal	0	Seizures almost stopped on medication. (One in last year)
A.H.	Hyparrhythmia or similar to P.M. variant	Severe	Diffuse and total dysrhythmia with hivolt, wave and spike complexes.	0	Marked improvement in seizure and mental attitude
R.B.	Diffuse myoclonic spells, similar to P.M. Variant		Normal	0	Much improved seizures, both frequency and severity on medication.

contrast to their pre-ictal state. There were no cerebral palsies among this group (Table VIII). Only one child had a pneumoencephalogram (T. S.) and that was normal.

For evaluation of the cases from the standpoint of seizure control, medications of choice, and the prognosis for these children, see Table VIII and IX. It will be noted that, while there were three cases of retardation, the seizure control was good in all five cases, in contrast to the vaccine group. Mebaral was the drug of choice in two cases, Mysoline in one, Tridione in the third, and Tridione plus A.C. 695 in another. Two patients are considered to be essentially normal, two are likely candidates for state hospital care, and one, though retarded (A. H.) has made such remarkable progress in the one and one half years following his encephalopathy that judgment had best be withheld at present. It is possible, therefore, that three of five cases of pertussis encephalopathy will show a satisfactory recovery and certainly a definitely encouraging control of their seizures.

Mechanisms of Production of Pertussis and Pertussis-Vaccine Encephalopathy

In the case of the encephalopathy produced by the active pertussis infection, it is not all difficult

TABLE VIII

Name	Age in Months or Years	Months Since Encephalitis	Follow-up Examination		
			Cerebral Palsy	Seizures	Mentality
J.E.	14 years	6 years	0	0	Normal
D.P.	12 years	9 1/2 years	0	0	Normal
T.S.	6 years	4 1/2 years	0	+	Retard.
A.H.	5 1/2 years	1 1/2 years	0	+	Retard.
R.B.	15 years	7 years	0	+	Retard.

TABLE IX

Name	Best Medications	Recommended Future	Prognosis
J.E.	Mebaral	Normal routine	Excellent-recovered
D.P.	Tridione	Behavior difficult, improving on psychotherapy	Good—intelligence is norm.
T.S.	Mebaral	Committed to State institution	Poor
A.H.	Peganone (AC 695) Tridione	Fair outlook—though retarded, is improving	Needs more observation
R.B.	Mysoline	Recommended for State guardianship	Poor

to conceive of the nerve cell damage which could result from endotoxins and exotoxins acting directly on the cortical and nuclear cells. In addition, the likelihood of the severe cerebral congestion produced by coughing probably makes anoxia and hemorrhage an additional hazard. An interaction of all forces in severe cases of pertussis may be responsible for the marked encephalopathy which results.

In the case of the vaccine encephalopathy, the picture is not so clear. Many of the toxins, if not the majority (both exotoxins and endotoxins) are probably destroyed by heat and preservation; this was demonstrated by Berdet and Gengou.⁶ This would cast serious doubt on the theory of direct toxin effect in the case of pertussis vaccine disease. The other major hypothesis is that an antigen-antibody response is established, resulting in a destructive neutralization phenomenon, perhaps with the liberation of an histamine-like substance. However, this probably would not account for the cases in which the baby is getting his first injection, and by virtue of his age has likely had little chance to encounter and react to a sufficient dose of *H. pertussis* organism to establish a sensitization. The studies of Byers and Moll,¹ when reviewed in the light of this present paper, would make one wonder whether the preparation of the

vaccine (fluid vs. alum) is of any very great significance, or whether there must not be some substance, not heat-labile, which is present in pertussis vaccine of all types, and which offers potential danger no matter what the product.

Relative Pertinence of Sex Incidence

As noted in the excellent work of Byers and Moll, there is an apparently definite sex predilection among all males for both vaccine and pertussis encephalopathy—nine of our current ten cases were boys. In this small group of patients, the sequence of the involved injection was not found to be of any significance. The electroencephalographic findings in both types were similar, and the small number of air encephalograms makes that measurement invalid. In comparison, the two diseases produce very similar clinical and laboratory pictures.

Discussion

Arguments in Favor of Continuing with Prophylactic Pertussis Inoculation.—Despite the obvious dangers inherent in any form of pertussis vaccine, it seems that there are equal, if not greater, dangers in not using the vaccine. In consideration of the hundreds of thousands of pertussis inoculations of all kinds given to children under age five each year, the risk is not as great as it might seem. One must remember that just a few years ago pertussis was probably the greatest infectious cause of infant death in the first year of life. That was far more evident to the practicing pediatrician than is the pertussis encephalopathy which seems foreign to the personal experience of most pediatricians. Despite frequent toxic and febrile reactions, it is unusual to find a pediatrician who has had a case of this disease among his patients; this is probably also true among the family physicians throughout the country. For this reason, it would seem feasible to continue at present with the pertussis inoculation program. It would be wise, however, to keep the following considerations in mind when vaccinating for pertussis:

1. Consider carefully the child who has a history of febrile seizures, especially if severe. Be prepared to prevent this complication if the vaccine is to be used.

2. In the presence of a history of severe reaction to previous immunizations (tetanus, et cet-

era), it may be wise to split up the doses, if not abandon the procedure entirely.

3. In the presence of pre-existing cerebral damage, the danger of an additional insult is possible with further loss of mental and neurologic potentiality.

4. There seems little evidence as yet to suspect that a family history of seizures would greatly enhance the danger of encephalopathy from pertussis vaccination. Livingston,⁷ in his recent book on convulsive disorders in childhood, finds no specific reason to deny the average epileptic child the benefits of immunization.

Conclusions

This is the report of five cases of pertussis encephalopathy and five cases of encephalopathy following vaccination against pertussis with alum-precipitated DPT vaccine. It is noted again that this disease is more prevalent in male children, closely resembles the natural disease, results in a high incidence of epilepsy and mental retardation, and produces a high degree of cerebral dysrhythmia. At the present time it seems likely that, despite the inherent dangers of vaccination, the danger of nonvaccination is potentially more hazardous. The demonstration in this paper of DPT vaccine cases and the prior reports of fluid toxoid encephalopathy further complicate the concepts of the etiology of this affliction. Several considerations to be made before pertussis vaccination is begun are elaborated. It would seem that severe reactions, especially pre-ictal reactions, noted with first or second pertussis inoculations, should seriously merit consideration for the discontinuance of the series.

Addendum

Since submission of this report four additional cases of DPT reactions with major seizures have been submitted to the author in the Twin Cities area. In addition, one case of myoclonic epilepsy beginning with pertussis infection associated with convulsions has been encountered.

Of the four cases showing convulsions and clinical encephalopathy following the first DPT shot, two have been severely affected (one, who is a hopeless spastic, received her shot at age seven years; one, who is now retarded and epileptic, received her shot at three months). One child is

(Continued on Page 556)

Gastric Ulcer

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THE CONTROVERSY as to whether a gastric ulcer should have medical or surgical treatment is a continuing one. The malignant propensity of gastric ulcer is particularly important, but also of importance in the comparison of medical versus surgical results are mortality and morbidity statistics computed for each type of treatment. Recent experience of the Nicollet Clinic will be presented.

Review of Literature

There is, on the one hand, the large experience of the Mayo Clinic,¹ where it is reported that 80 per cent of all small gastric ulcers treated medically had unsatisfactory results; 33.8 per cent of these medically treated cases eventually had surgical treatment. Strode² believes that there is little or no place for medical management for gastric ulcer. Martin and Lewis³ in England believe that the natural course of gastric ulcer is not influenced by medical treatment, which is dictated by the nature of the disease rather than the disease being altered by medical treatment. Their experience indicates that gastric ulcers of long standing rarely heal.

On the other hand, are those^{4,5} who claim that in only 1 or 2 per cent of carefully controlled medically treated cases will malignant lesions be included and that this medical error is within the range of surgical mortality. Brown at the Cleveland Clinic,⁴ for example, cites an incidence of 1.1 per cent of carcinoma in 715 cases of gastric ulcer. This is an unusually low figure. The Mayo Clinic¹ reports this incidence as 10.4 per cent in their group of 414 benign-appearing ulcers, which were observed for at least five years. It is difficult to assess this figure from the Lahey Clinic report,⁶ which concludes that "a month or less of intensive medical management in many cases of gastric ulcer is justified." It is interesting that, despite insistence on the value of medical treatment in selected cases, the percentage of patients with

gastric ulcer operated on at the Lahey Clinic has risen from 40 per cent in 1948 to 58 per cent in 1953. At the Mayo Clinic this surgical rate has remained between 60 and 70 per cent for many years. Also, at the Mayo Clinic⁷ in 550 cases operated upon between 1938 and 1942 with a preoperative diagnosis of benign gastric ulcer, 13 per cent were found to have malignant lesions. Wangenstein⁸ gave this incidence at 10 per cent. Ransom⁹ found an incidence of microscopic malignancy in 10 per cent of operative specimens, and in none of these was the diagnosis made by the operator at the time of surgery.

One of the most striking features of malignant gastric ulcer is that five-year survival rates are higher than those for other types of gastric carcinoma. In the Mayo Clinic cases⁷ of preoperatively diagnosed benign but pathologically proved malignant ulcers, 43.5 per cent lived five years or more following operation. In Ransom's series, 41 per cent of the cases in this category surviving operation lived five years or more. Therefore, this is a particularly fruitful field for surgical therapy in the usually dismal picture of stomach cancer.

Entirely aside from the matter of malignancy in the comparison of medical versus surgical results in gastric ulcer are the over-all figures for mortality and morbidity. The best surgical mortality figures are between 1 and 2 per cent. In the Mayo Clinic series of 414 patients treated medically,¹ only 20.5 per cent were considered to have had satisfactory results. On the other hand there are frequent assertions in the literature¹⁰ that at least 90 per cent of the surgically treated patients have satisfactory results. It is well known that morbidity and mortality following gastric resection for gastric ulcer are much less than those following gastric resection for duodenal ulcer.

Material

The material to be presented is from the Nicollet Clinic and includes those cases which

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Presented before the Minneapolis Surgical Society,
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TABLE 1. DIAGNOSIS IN SURGICAL CASES

X-RAY		PATHOLOGIC	
Benign	28	<i>Benign</i>	<i>Malignant</i>
Malignant (probably)	2	25	3
Malignant (possibly)	3	2	0
Obstruction	3	3	0
Unsatisfactory	1	3	0
Total	37	1	0
		34	3

were originally diagnosed as benign gastric ulcer. This series extends from 1943 through 1956 and includes only those cases in which a definite diagnosis was made. Cases which were diagnosed as "possible" or "probable" without additional confirmation by the roentgenologist were excluded. A large percentage of the patients were from out of the city, so that much of the follow-up was done by questionnaire.

There were fifty-six cases in all, eighteen of which were treated medically and thirty-eight treated surgically, thus giving a surgical rate of 68 per cent. The ages of the patients varied from twenty-nine to seventy-five. There were thirty-five men and twenty-one women, or roughly a two to one proportion. A total of twenty-six ulcers were located along the lesser curvature, whereas none were along the greater curvature. The remaining ulcers were located as follows: pre-pyloric, twelve; pyloric, eleven; cardiac, four; body, three. The ulcers which were subsequently found to be malignant were located as follows: cardia, two; mid lesser curvature, two; pylorus, one. No ulcers either benign or malignant were located along the greater curvature. A benign ulcer of the greater curvature is rare.

Diagnosis

The initial x-ray diagnosis in the surgical cases was correlated with the pathologic diagnosis (Table I). There were twenty-eight benign diagnoses made by the roentgenologist, compared with twenty-five benign and three malignant pathologic diagnoses. There were five cases described by the roentgenologist as probably or possibly malignant; all of these five were benign pathologically.

Gastroscopic examinations were done in nine patients, in several of whom more than one examination was done. It should be remembered that these nine patients were those extremely difficult to diagnose and were referred to the gastroscopist for this reason. There were three cases diagnosed benign by the gastroscopist; one of these was malignant by pathologic examination.

TABLE II. SURGICAL PROCEDURES DONE

Billroth II	25
Billroth I	6
Transthoracic gastric resection.....	3
Transthoracic exploration	1
Gastroenterostomy	1
Local excision	1
Abdominal exploration	1
Ligation of arteries	1
Vagotomy and re-resection	1

This was the only serious error made by gastroscopic examination. There were four cases diagnosed malignant by gastroscopic examination three of which were benign and one malignant by pathologic examination. There were two indeterminate cases, both of which were benign by pathologic examination. It may be stated in summary that gastroscopic examination was in general of considerable help, but certainly not infallible.

Surgical Results

Table II illustrates the various surgical procedures done. The three transthoracic gastric resections were done for ulcers at the cardia. The one gastroenterostomy was done in 1943 for a large perforating posterior ulcer near the lesser curvature. There were multiple adhesions, and resection was impossible in the opinion of the surgeon. The one local excision done was also for a suspicious ulcer at the cardia. Symptomatic results in this case have been excellent, as determined by two year follow-up. There was one patient with profuse hemorrhage in persistent shock, who was taken to the operating room where the left and right gastric arteries were ligated as an emergency procedure. Several days later he withstood gastric resection successfully. Vagotomy and re-resection were done in a case of gastrojejunocolic fistula following resection.

There were forty surgical procedures done on thirty-eight patients with one surgical mortality, or a patient death rate of 2.6 per cent. This one mortality occurred in a sixty-three-year-old man, a known cardiac patient, who was operated on as an emergency procedure because of severe hemorrhage. He died the day of surgery from cardiac complications. If one excludes emergency procedures, then, the surgical mortality in the elective cases was zero.

There were five serious long-term surgical complications. The first was a stomal ulcer with subsequent slight to moderate hemorrhage following the single gastroenterostomy done for benign gastric ulcer in this series. It is the consensus of the literature that gastroenterostomy is

ery seldom followed by stomal ulcer when this procedure is done for benign gastric ulcer. This is in contrast to the situation when this procedure is done for duodenal ulcer.¹ The second long-term complication was the gastro-jejuno-colic fistula following gastric resection. This occurred in a forty-three-year-old woman with a large gastric ulcer on the posterior wall near the lesser curvature penetrating into the pancreas. I am unable to find a report in the literature of this complication following gastric resection for benign gastric ulcer. The Cleveland Clinic published a report of a stomal ulcer following gastric resection and Billroth I procedure done for benign gastric ulcer, and considered that complication a rarity.¹¹ Certainly a stomal ulcer progressing to a fistula after resection for benign gastric ulcer is an extremely unusual complication. Even more remarkable is the rapidity with which this fistula occurred, only three months following the original resection. At re-operation at this three-month period, re-resection and vagotomy were done. A huge marginal ulcer measuring 10 cm in diameter was removed at the site of the fistula. This patient is well two years following this second procedure. Unfortunately, no gastric acid determinations were done.

A third serious long-term complication in one patient is a recurrent empyema following transthoracic resection, for which the patient refuses further surgery. A fourth complication was diagnosed as recurrent aspiration pneumonia following a transthoracic resection of the upper two-thirds of the stomach and the lower inch of the esophagus for a large suspicious ulcer at the cardia pathologically proved benign. The normal gastroesophageal pinch-cock mechanism has been destroyed in this patient, thus allowing regurgitation of stomach contents including bile into the throat and subsequent aspiration. It is hoped that elevation of the head of this patient's bed during the night will prevent further episodes. The fifth complication is severe postprandial gastrointestinal distress in an emotionally unstable woman. This complication has been diagnosed elsewhere as a dumping syndrome. This series is remarkably free of dumping syndromes, as I think is probably the case generally for resection for benign gastric ulcer, although a Mayo Clinic report suggests the contrary.¹² The low acids encountered in this disease make it possible to remove less stomach without fear of marginal

TABLE III. FOLLOW-UP OF PATIENTS OPERATED ON FOR BENIGN GASTRIC ULCER

Good	24
Fair (probably will be good)	2
Fair (some vomiting)	1
Poor (stomal ulcer: posterior gastroenterostomy)	1
Dead (unrelated causes)	2
Total	30

ulceration. It has been repeatedly demonstrated that the incidence of dumping syndrome is less in those cases where a more conservative gastrectomy is done.

Table III appraises the surgical results. The two patients listed as fair probably will be good. In one of these, recurrent empyema and, in the other, recurrent aspiration pneumonia occurred. In essence, then, approximately five out of six surgical patients have had good results. If one excludes the patients dead of unrelated causes and the surgical results of procedures other than resection, the results are good in more than 90 per cent of the cases.

There were four patients with malignant ulcers who were treated surgically. One was explored transthoracically. This patient had been treated elsewhere for two years with the diagnosis of benign gastric ulcer. Exploration at our Clinic revealed a nonresectable carcinoma, and the patient died of recurrent hemorrhage three weeks following surgery. The second case has been mentioned previously as having been diagnosed gastroscopically and also roentgenologically as a benign ulcer and was observed for almost one year in our Clinic. This patient eventually had an operation because of abdominal cramping, which surgical exploration revealed to be small bowel obstruction from a nodule metastatic from a malignant ulcerating lesion of the stomach. The third patient was operated on with a diagnosis of benign gastric ulcer. Resection was done and malignancy proved by microscopic examination. This patient died of generalized metastases three and a half years after surgery. The fourth and last patient in this group was a lady in whom a benign diagnosis was made on upper gastrointestinal x-ray. One month later, severe upper gastrointestinal hemorrhage occurred with a resultant hemoglobin of 6 grams. At that time roentgenologic diagnosis was probable malignant gastric ulcer near the cardia. A Billroth I resection was done. The lesion was carcinoma, and there were metastases in the regional lymph nodes. This patient is living and well three and a quar-

TABLE IV. SUMMARY OF RESULTS IN MEDICALLY TREATED CASES

Good	8
Poor	1
Fair	1
Dead (2—carcinoma)	3
Total	13

ter years later. A summary of this series reveals, therefore, only two patients with preoperative diagnoses of benign gastric ulcer who had resections, so that it is not possible to determine whether the relatively good five-year survival results reported elsewhere are confirmed by our series.

Medical Results

The results in the medically treated cases are summarized in Table IV. Thirteen of the eighteen medically treated patients were observed for periods of one year or more. Of these there were eight good results. Seven of these cases were observed from five to eleven years. Three were observed four years. One case with a dramatic and unfortunate result was observed only six days. This is the case of a woman, thirty-three years old, approximately five months post partum. Her stomach roentgenogram was diagnosed as showing a benign gastric ulcer on the lesser curvature. Six days later she died suddenly. A coroner's postmortem examination revealed what appeared grossly to the pathologist as a benign gastric ulcer. Microscopic examination, however, revealed adenocarcinoma with metastases in the regional abdominal and mediastinal lymph nodes. There were also diffuse lymphatic metastases in the lungs.

There was a total of five patients in this group who had medical management and subsequently had cancer. The first case is that of the thirty-three-year-old woman just described. The second is that of a patient who originally had a diagnosis of benign gastric ulcer, but approximately one month later this diagnosis was changed to that of probable malignant ulcer. Surgery was advised but refused by the patient. This patient was operated on elsewhere five years later, and carcinoma of the stomach with metastases was found. He died one year later, six years after the original diagnosis at the Nicollet Clinic. The remaining three cases in this group have already been discussed among the surgical cases.

In summary, there were five cases of gastric

TABLE V. INDICATIONS FOR SURGERY

	Primary	Secondary
Intractability and recurrence	17	2
Carcinoma	4	
(suspect)	4	
Hemorrhage	5	13
Obstruction	7	
Perforation	1	
Total	38	

ulcer proved pathologically malignant at surgery or autopsy in this series of fifty-six cases of gastric ulcer originally diagnosed benign at the Nicollet Clinic or in one of several Minneapolis hospitals. This is a 9 per cent incidence of malignancy in this series.

Table V presents the indications for surgery in this series. It is obvious that intractability and recurrence represent the most frequent complications of gastric ulcer and therefore the most common indications for surgery. This was the primary indication for surgery in seventeen of the cases. Carcinoma was next with eight either overt or suspected carcinomas. Hemorrhage and obstruction were less frequent. There was one perforation.

Discussion

In summary, it appears that formulation of hard and fast rules from data such as those given here is difficult. In 68 per cent of the cases operations were done, which is approximately the same percentage reported in much larger series from the Mayo Clinic and the Lahey Clinic.

That many gastric ulcers heal is unequivocal. Small, undisputably benign ulcers of short duration should perhaps have medical management if one feels that the risk of malignancy is less than the risk of operative mortality. The longer the duration of a gastric ulcer, however, the more probable are complications such as hemorrhage, obstruction, and perforation, as well as malignancy. Recurrence, persistence over three to six weeks, extensive penetration or large diameter, roentgenologic or gastroscopic appearance indicating malignancy, achlorhydria, difficult follow-up, or suspicious location—any of these indications should dictate immediate surgery. The surgical mortality rate in this disease is low, mainly because of the ease and safety of closing the duodenal stump in gastric as opposed to duodenal ulcer cases. Malnutrition, anemia, stomal ulcer, and the dumping syndrome are mild or infrequent postoperative complications in gastric ulcer cases. This is true because of low acids and the

possibility of doing a less extensive resection than is necessary for duodenal ulcer cases. Although the Billroth I operation is condemned by some,^{6,10} for duodenal ulcer, this procedure is very satisfactory for gastric ulcer.

Conclusions

1. Some gastric ulcers of short duration are amenable to medical treatment.
2. Surgery is indicated in those cases with obvious complications, where malignancy is suspected, or where medical treatment of not longer than three to six weeks' duration is ineffective.
3. The increasing incidence of surgical treatment of gastric ulcer is validated by the results which are good in over 90 per cent of the cases.
4. The results of surgical therapy for malignant gastric ulcer are better than for other types of gastric carcinoma.

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EARLY DETECTION OF CANCER MAY NOT BE EARLY ENOUGH

In some types of cancer, the earliest detectable diagnosis may not be early enough—in fact, some cancers may be widespread even when still too small to recognize by present diagnostic methods, according to a report (May 1, 1957) in *The American Journal of Roentgenology, Radium Therapy and Nuclear Medicine* by Drs. Harold Tivey and Vincent P. Collins, both of Houston, Texas.

Drs. Tivey and Collins also expressed some misgivings and doubt about some claimed "five-year" cures in cancer treatment, where cure is assumed in some statistical reports if the cancer does not reappear within the five years of treatment.

"It would appear that only in those diseases which have a very short duration does the five-year survival have a reliable prognostic significance for the individual," the two scientists added.

"There is some small volume of data collected to indicate that the earliest detectable diagnosis may not be early enough. It seems possible that some cancers may disseminate widely at a time when they are too small for clinical recognition by any of our present methods," they continued.

"A more complete analysis, to include 'cures,' is needed. This cannot be accomplished reliably until we know how early tumors metastasize. With detailed knowledge of tumor doses necessary to eradicate local disease, we could then calculate with some assurance the expected effect of early diagnosis," Drs. Tivey and Collins went on.

The two Houston scientists then discussed usable criteria of cure for cancer based upon the "natural history" of the disease.

"Since the five-year cure rate will consistently overestimate the proportion of patients cured, this proportion, when evaluated in terms of the natural history of disease . . . will result in substantially lower proportions of cures," they pointed out.

In group statistical analysis, the concept of a disease's natural history has the overwhelming advantage of enabling the investigator to predict the ultimate outcome of all his cancer patients being treated, the Baylor University investigators went on.

They added their belief that for the individual patient, too, separate from the group evaluation, the criterion for cure must be based upon the natural course of the patient's malignant tumor.

Other suggestions advanced by the Houston researchers:

. . . Clinical staging of disease, where the extent of cancer is specified in certain "stages," may be in some instances a reflection of the inherent growth rate of the tumor rather than the patient delay to detection of the tumor.

. . . In one group of patients with stomach cancer, surgically operated patients had typically twice as long patient-delay as inoperable patients, i.e., those patients for whom surgery would have done no good. This is more readily explained if longer persistence of symptoms implied a more slowly growing tumor.

. . . By determining the growth rate of a cancerous tumor and then treating it, if it did not recur within the time required for it to grow, this simple criterion could prove a useful definition cure for the individual patient.

Present-day Concepts of the Treatment of Ulcerative Colitis

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THE treatment of chronic ulcerative colitis has been a perplexing problem for physicians and surgeons alike as long as this condition has been known as a clinical entity. Despite the many remarkable advances of modern medicine, ulcerative colitis continues to present a challenge to investigators. Its etiology is still unknown, and no truly specific treatment has yet evolved. Nevertheless, it is possible to manage the great majority of these patients successfully and permit them in most instances to lead a normal life.

Ulcerative colitis has been known as a clinical entity for less than eighty years. Sir Samuel Wilks¹ in 1875 first distinguished this condition from the large group of other enteric maladies with which it had until then been confused. Since early workers first focused attention on ulcerative colitis, both medical and surgical treatment of the disease have passed through many interesting phases as medical knowledge grew. To understand fully the modern concept of therapy of chronic ulcerative colitis, it is instructive to review briefly the development of medical and surgical treatment and their integration through the years.

Medical Treatment

Conservative treatment of ulcerative colitis at first consisted of the use of a wide variety of medications which were used for rectal irrigations and instillations. The first real advance in medical therapy came in 1924, when Bargaen² described experimental studies on the etiology of ulcerative colitis. Smears were taken from the rectal mucosa of ulcerative colitis patients and Gram-positive diplococci were isolated in 80 per cent of the cases. This seemed conclusive evidence that ulcerative colitis is an infectious process, so a vaccine was prepared for the organism which had been isolated. The Bargaen vaccine was used in the treatment of this disease, often with satisfactory results, until the advent of Neoprontosil in 1938. The results obtained through the use of this drug

were as good or better than those obtained with the vaccine.^{3,4}

From that time onward, with the development of various sulfonamides and antibiotics, they have all been utilized for the treatment of chronic ulcerative colitis.

Bargaen⁵ in 1949 introduced in this country a drug called salicylazosulfapyridine. Commercially, this is known as either Azulfidine or Azopyrine. It is an azo compound between salicylic acid and sulfapyridine. Because this drug is an acid azo compound, it has an affinity for connective tissue (including the submucosa of the colon), and aminosalicic acid and sulfapyridine are liberated gradually. This drug has been used extensively in the treatment of ulcerative colitis with encouraging results and no serious side effects. The newer broad spectrum antibiotics have found limited usefulness in the treatment of ulcerative colitis. They are used chiefly for the acute fulminating form of the disease in which superimposed secondary infection probably plays a large role.

In 1950, cortisone and ACTH were first employed for the treatment of ulcerative colitis.⁶ It appeared that most patients got a prompt remission with disappearance of the acute inflammatory reaction of the colon, a feeling of well being, improved nutritional status, reduction of bloody stools, and increase of appetite. The hormones bring about a remission of the disease but, as is the case with all other forms of treatment, the fundamental disease process remains. Flare-ups commonly occur upon withdrawal of the hormones. Probably the major drawback in the use of the hormones is that certain serious complications have occurred following their administration. These include clinically unrecognized perforation of the colon, as well as the more widely known complications of steroid therapy.

Some evidence has been gathered that psychiatric abnormalities play a role in the etiology of ulcerative colitis. Groen⁷ and Morrison⁸ reported excel-

lent results through the use of psychotherapy for ulcerative colitis patients. It has been noted that some patients with this disease who have received electric shock therapy showed definite improvement. It is evident from the foregoing that the search for a specific treatment for ulcerative colitis has been wide and varied and, as yet, not truly successful.

Surgical Treatment

The surgical treatment of ulcerative colitis has also passed through several phases as knowledge has grown. The first operations, cecostomy and appendicostomy, were done for the purpose of making possible more thorough irrigation and injection of medications to bathe the diseased mucosa. The next procedure devised was that of ileostomy. It became apparent that diversion of the fecal stream would be of value to put the diseased colon at rest. This operation was not widely accepted until the early 1920's when it began to gain in favor. For the next twenty years this was the operation of choice for ulcerative colitis, but it was evident that something was lacking in this form of treatment. Few patients with ileostomy improved sufficiently to have an anastomosis made, and many gradually became worse and died.

Sir Arbuthnot Lane⁹ was the first to attempt a series of colectomies for ulcerative colitis. He did this with remarkable success, performing fifty-two colectomies between 1909 and 1913, with a mortality of only 10 per cent. This operation was done sporadically by various surgeons in the ensuing years. These colectomies were done in several stages. MacGuire¹⁰ in 1940 described the first one-stage total colectomy and abdominoperineal resection. From this time and for over ten years, the usual surgical practice was to do a preliminary ileostomy followed in a few months by a colectomy. The rectum was usually saved with the hope of restoring continuity later by means of an ileoproctostomy. Experience demonstrates that, unfortunately, this latter procedure was rarely successful because of subsequent flare-up of disease in the rectum. Most surgeons have come to agree that it is useless to try to preserve the rectum when surgery is necessary for ulcerative colitis. More and more when the patient's condition permits, one stage ileostomy, colectomy, and resection of the rectum is done.

Results of Treatment of 114 Cases of Ulcerative Colitis

A study was made of cases of ulcerative colitis from our own practice. Only those cases were selected for review that had been personally

TABLE I. RESULTS OF TREATMENT WITH AZULFIDINE

Results	Number	Per Cent
Excellent	34	36.9
Good	40	43.5
Poor	13	14.1
Reactions	5	5.5
	92	100

treated by us and then followed up thoroughly enough to yield some real information. Cases that were seen initially in the acute fulminating stage and operated upon soon afterward are not included, as no other treatment could be employed.

A group of 114 patients with adequate follow-up was chosen for review. Of this group, ninety-two cases were treated within the last five years. Azopyrine has been used during this period in our practice as the treatment of choice. The remaining twenty-two cases were treated before the advent of Azopyrine.

The incidence of ulcerative colitis was fairly evenly divided between the sexes; 55.3 per cent were females and 44.7 per cent males. The age of onset of the disease varied from two years to seventy-three years. The incidence in children was a little surprising. In the Azopyrine treated group alone, thirteen of the ninety-two patients were below sixteen years of age at the onset of symptoms. The symptoms of the disease in 108 cases where they were recorded were as follows:

Bleeding, 91.7 per cent
Diarrhea, 53.7 per cent
Constipation, 13.0 per cent
Constipation and diarrhea, 2.8 per cent
Abdominal distress, 31.5 per cent
Passage of mucous, 23.1 per cent

Bleeding was the sole symptom in 24.1 per cent of the cases. It is interesting to note that about 44 per cent of all the cases did not have diarrhea. Their stools were either normal or constipated. The results of treatment with Azopyrine are shown in Table I. Excellent or good results were obtained in 80.4 per cent. The response was considered excellent in cases with prompt remission of symptoms and healing of the rectal mucosa demonstrated by proctoscopic examination within one month.

Those classified as good usually had a symp-

TABLE II. COMPLICATIONS IN 26 OF 114 PATIENTS (22.8 PER CENT)

Complication	Number	Per Cent
Polyps	12	10.6
Abscess	9	7.9
Perforation	3	2.6
Erythema Nodum	3	2.6
Fissure	2	1.7
Arthritis	1	.9
Stricture	1	.9
Ileitis	1	.9
Gangrenous Pharyngitis	1	.9
Obstruction	3	2.6
Fecal Fistula	1	.9

tomatic remission in the first few weeks of treatment, but three or four months elapsed before real healing was evident on proctoscopic examination. Reactions to the medication severe enough to necessitate discontinuing the drug occurred in 5.5 per cent of the cases. These consisted of nausea, drug rash, or fever. Seven other patients complained of nausea temporarily, but this subsided and they were able to continue the treatment.

Cortisone was used in addition to the Azopyrine in eight patients (8.7 per cent). Two of these had had an initial excellent and three an initial good response to Azopyrine with later unsatisfactory response. The other three never did have a good response to Azopyrine. Enough time has not elapsed for evaluation of the results of cortisone treatment in this small group of patients, although it does seem to have been of value to a few.

Complications observed in the entire group of 114 patients are recorded in Table II. The frequency of perirectal abscess in these patients is worthy of comment. This complication was observed in nine of the 114 patients. All but one of the patients complained of diarrhea as one of their major symptoms. The inference is that diarrhea resulted in anal cryptitis which, in turn, went on to cause a perirectal abscess.

Only four (4.3 per cent) of the patients treated with Azopyrine have subsequently required colectomy and ileostomy. In contrast to this, seven of the twenty-two cases treated before the advent of Azopyrine required surgery (31.8 per cent).

Discussion

The management of an ulcerative colitis patient should not be attempted without the use of the proctoscope as an aid in diagnosis and follow-up of the patient. It is not satisfactory to regulate medication by symptomatic improvement alone. Frequently, the mucosa will be seen to be ulcerated for several months after symptoms of the disease subside. Treatment must be continued

until there is actual healing of the mucosal lesions. Likewise, regular proctoscopic examinations will sometime reveal a flare-up of activity when the patient is not yet aware of any untoward symptoms.

Another point that must be made is that we should not be deluded into thinking that we are "curing" anyone with ulcerative colitis by means of any medicine now available. The disease is basically one of exacerbations and remissions. The best we are able to do with antibiotics, hormones, psychotherapy, et cetera, is to bring about a remission of the condition. Subsequently, the patient and physician alike should be alert for another flare-up of the process. Prompt recognition and treatment of any activity will usually bring things under control without any real disability to the patient.

It should be emphasized that while no truly specific treatment is available for chronic ulcerative colitis, medical treatment is successful in controlling the great majority of patients. There have been many times in the years that physicians have struggled with this disease when it seemed that surgery was the only hope of real improvement for victims of ulcerative colitis. Such is no longer the case. With intelligent medical management, fewer patients now develop acute fulminating symptoms and less surgery is being done. These patients must, however, be watched regularly and carefully through the years. Carcinoma of the colon is greatly increased in incidence in people with chronic ulcerative colitis. Barger¹¹ in 1954, reviewed 1,564 patients treated at the Mayo Clinic for ulcerative colitis in the years 1918-1937. A follow-up on these patients and statistical analysis of the results showed that the death rate from carcinoma of the rectum and colon among persons with chronic ulcerative colitis is thirty times greater than in the general population. The likelihood of development of carcinoma seems to increase with the duration of the disease. Dennis¹² reviewed his series and found the incidence of carcinoma as follows:

<i>Duration of Colitis</i>	<i>Incidence of Carcinoma</i>
Under 10 years.....	0 Per Cent
10-19 years	10.4 Per Cent
20 years and over.....	20.0 Per Cent

Therefore, patients who have had the disease longer than ten years should be followed regularly by proctoscopic examination and barium enema examination. Colectomy is indicated if there is

development of suspicious polypoid lesions of the mucosa or irregularities in the x-ray appearance.

After the diagnosis is established, it is our practice to institute treatment with Azopyrine. The usual dose is six to twelve tablets per day in three or four divided doses. If nausea occurs, the dosage can be reduced and later increased gradually. This schedule is continued for three weeks and then medication is stopped for one week. At that time the patient is again sigmoidoscoped. If activity persists, another course of Azopyrine is given, always resting for a week after it has been given for three weeks.

Symptomatic improvement usually occurs within the first few days of treatment. Usually two to three consecutive courses are needed to obtain healing of the mucosa. If a flare-up in activity occurs at some later date, the same plan is repeated.

Psychotherapy certainly plays a role in any successful management of an ulcerative colitis patient. For any nonpsychiatrist, this consists of understanding, reassurance, and advice.

Too much emphasis is placed by some physicians on the importance of dietary restrictions for these patients. Our advice to an ulcerative colitis patient is, "It's not what you eat, but what's eating you." No benefit is obtained from placing the patient on a soft bland diet. It is more important that he have a good general diet, high in protein and calories. The only foods that possibly should be eliminated are highly spiced food and such irritating materials as nuts and popcorn.

Cortisone and ACTH find limited application in our practice for ulcerative colitis. They have been used for a few patients who responded poorly to Azopyrine. The results are often quite satisfactory. Hormone therapy is also indicated for treating some of the complications of ulcerative colitis, including arthritis, pyoderma gangrenosum, and uveitis. In some desperately ill patients with acute fulminating colitis, ACTH and cortisone may be used to stabilize the patient. However, surgery should be done as soon as his condition permits. In our opinion, hormone therapy should not be used for the routine ulcerative colitis patient. The results with Azopyrine are just as good, and there are none of the serious complications from its use that are found with the hormones.

It is best to hospitalize a patient who is acutely

ill in an acute exacerbation. When there is fever, severe diarrhea with dehydration and electrolyte imbalance, and often serious bleeding, intensive treatment is needed. The use of broad spectrum antibiotics, intravenous fluids, and blood will often bring the situation under control.

Indications for surgery in ulcerative colitis are several, and may be briefly summarized as follows:

1. Patients with fulminating febrile attacks who are steadily losing ground despite medical therapy. Even if they respond temporarily to ACTH or cortisone, surgery should be done, as these hormones have no effect on the underlying disease process.
2. Perforation of the colon.
3. Obstruction.
4. Severe hemorrhage.
5. Patients who are semi-invalids and unable to continue in their normal occupations because of frequent severe diarrhea.
6. Debilitating infectious arthritis.
7. Colectomy should be considered in any patient having the disease over ten years, especially if there is suspicious bleeding or abnormal findings on proctoscopic or x-ray examination. The incidence of carcinoma of the colon in these patients is over 20 per cent.

Surgery should not be undertaken lightly in patients with ulcerative colitis. The operation of total colectomy does actually restore them to health as no medical treatment can, but there are several other factors to be considered. Most patients learn to live with and care for an ileostomy quite well and are well adjusted. Nevertheless, quite an emotional adjustment is necessary, and unless there are good indications for surgery, it is best left undone. Furthermore, surgery on an ulcerative colitis patient seems to be fraught with more complications than most other operations. Cooper¹³ in 1956 reported the complications that followed surgery on 107 patients with ulcerative colitis. Only 23 per cent of these patients failed to develop a postoperative complication. Colcock¹⁴ recently reported a series in which the incidence of complications was very similar.

Intelligent use of all methods at our command, medical and surgical, is yielding better results in the treatment of ulcerative colitis than have ever been possible before. Let us hope that the search for a specific treatment for the disease is a short one.

Summary

1. A review of the evolution of medical and surgical treatment of ulcerative colitis has been presented.

2. The results of treatment of 114 cases of ulcerative colitis are described.

3. Azopyrine is the drug of choice for ulcerative colitis. Limited use of ACTH and cortisone and psychotherapy are helpful.

4. It is important that proctoscopic examination be utilized for diagnosis and follow-up of the patient.

5. It is possible to induce a remission of the disease, not a permanent cure, by medical treatment.

6. The operation of choice for ulcerative colitis is removal of the entire colon and rectum with construction of an ileostomy. This is all done in one stage if possible.

7. It is possible in the great majority of cases to manage patients with ulcerative colitis by medical means. Surgery is reserved for complicated and intractable cases.

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ENCEPHALOPATHIES FOLLOWING DPT INOCULATIONS AND PERTUSSIS

(Continued from Page 546)

nervous and a behavior problem, while the fourth patient seems clinically well.

This brings the total pertussis vaccine cases to nine, six with severe neurologic involvement and two with moderate involvement. Only two are considered completely well. Three of five children with pertussis infection are considered to be essentially normal.

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Renal Failure following the Administration of Intraperitoneal Neomycin

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MANY clinical and experimental reports exist in the literature on the benefits of intraperitoneal neomycin in the treatment of acute bacterial peritonitis, or for prophylactic purposes following routine abdominal surgery.¹⁻⁶ In a comparative investigation neomycin was considered the drug of choice among oxytetracycline, tetracycline hydrochloride and neomycin.¹ One recommended regimen is as follows: One gram of neomycin in 500 ml. of normal saline at the time of surgery and 0.5 grams of neomycin in 250 ml. of normal saline every six hours thereafter, via polyethylene catheters placed into the peritoneal cavity at the time of surgery. The postoperative treatment is maintained for as long as seventy-two hours with a total dose of as much as 7 grams of neomycin. This regimen is very effective in sterilizing the peritoneal cavity.¹ While it is known that neomycin is a nephrotoxic drug, clinical trial and experimental evidence would appear to have established the safety of the above regimen.^{1,2}

Following is a case report of death from renal failure occurring after the instillation of neomycin for peritonitis associated with appendicitis with rupture.

Case History

Mr. A. J., aged fifty-five, was hospitalized eighteen hours following the onset of lower abdominal pain which had localized in the right lower quadrant. Six hours prior to admission the patient experienced excruciating lower abdominal pain with radiation to the back. There was some relief following this episode. He vomited bile-colored material on four occasions before hospitalization. The patient had a normal bowel movement on the day of admission. He preferred to lie on his side with knees flexed on the abdomen and he avoided all unnecessary movement. His pulse rate was 112, and regular and blood pressure 140/80. Examination of the abdomen revealed widespread board-like rigidity, tenderness and rebound tenderness. Bowel sounds were absent and rectal tenderness existed in all quadrants.

Roentgen examination of the abdomen revealed small

and large bowel distention and a laminated radio-opaque stone in the region of the appendix, believed to represent a fecolith. Laboratory examination revealed a leucocyte count of 12,500 with 80 per cent neutrophils, 18 per cent lymphocytes and 2 per cent monocytes. The hemoglobin was 15.8 gms., serum amylase within normal limits. Urinalysis was negative, with a specific gravity of 1.029 (before intravenous glucose). The blood urea nitrogen was 19 mg. per cent, CO₂ was 30 meq/l and Cl 100 meq/l.

Emergency laparotomy was performed two hours following admission and a foul, watery exudate poured from the abdominal cavity. A gangrenous, perforated appendix with a fecolith at the base was removed. A severe, generalized peritonitis existed with accumulations of pus of 300 ml. in the pelvis and 200 ml. in both subphrenic spaces. Cultures of this material grew *E. coli*. All purulent material was aspirated and the peritoneal cavity was lavaged with saline. Polyethylene catheters were placed in both subphrenic spaces and in the right lower quadrant to be used to instill neomycin solution during the postoperative period. One hundred ml. of 1 per cent neomycin was placed in the abdominal cavity prior to closure. One unit of blood was given following surgery.

The patient was not hypotensive during or following surgery nor did he exhibit chills. The rectal temperature never exceeded 101.8° F. Over the first thirty-six hours following operation the patient received 3 grams of neomycin intraperitoneally as a 1 per cent solution. Parenteral penicillin and streptomycin were also given.

The patient responded to the treatment with return of temperature to normal and return of bowel activity by the fourth postoperative day. An adequate urine output existed throughout the illness (Table I). During this period the urine excreted revealed a fixed specific gravity (1.010) and uremia rapidly developed. The patient became progressively more lethargic and confused, and expired with bronchopneumonia on the sixteenth postoperative day. Table I contains pertinent fluid, electrolyte and serum chemistry data during the hospital course.

Postmortem examination* revealed bilateral bronchopneumonia (*Pseudomonas aeruginosa*). The kidneys showed swelling of the proximal tubular epithelium and hydropic degeneration. The tubular epithelium showed extensive degeneration with some regeneration. The

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*Postmortem examination was performed by Dr. Bruce W. Jarvis, and microscopic slides were reviewed by Dr. Jarvis and Dr. James Dawson, Department of Pathology, University of Minnesota.

TABLE I. PERTINENT DATA DURING HOSPITAL COURSE

Hospital Day	1*	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Intake ml.	3000	3000	3000	2400	3500	3500	3500	4000	4000	4000	4200	6000	3700	2500	5000	3315
Urine Output ml.	700	500	720	720	1100	1800	1500	1500	2800	3100	1800	2000	1000	1000	1100	1100
Urine—specific gravity	1.030	1.015	1.010	1.012	1.003	1.005	1.008	1.008	1.010	1.006	1.010	1.006	1.010	1.012	1.010	1.012
BUNmg %	19	35		98	113	140		200		180		181		184		194
CO ₂ meq/l	30	27		22	18	20		22		22		16		9		11
Cl meq/l	100	101		99	94	88		92		90		95		94		95
Na meq/l		143		135	137	133		138		140		138		130		140
K meq/l		5.3		6.5	5.9	5.7		5.1		5.1		5.2		5.5		4.5
Hbg gm %	15.8	11.8		13.3		13.3			14.6						16.8	
WBC	12,450	13,600		14,200		8,400			6,800						7,500	
Urinalysis				1+ Albumin						0						

*Day of surgery.

microscopic appearance was compatible with a toxic nephropathy but not consistent with a transfusion reaction. Only minimal peritonitis remained at the time of death.

Discussion

Neomycin does not produce a pathognomonic alteration in the gross or microscopic appearance of the kidney, and for this reason one cannot state categorically that the renal failure encountered in the patient under consideration was produced by neomycin. However, it is strongly suggested that neomycin was the causative factor, since the patient had normal renal function preoperatively, underwent a relatively simple operation without occurrence of hypotension, oliguria or clinical evidence of bacteremia, but developed progressive renal failure starting within twenty-four hours of the time intraperitoneal neomycin was instilled. The pathologic examination did reveal a severe toxic destruction of the kidney compatible with a drug reaction and not characteristic of an incompatible blood transfusion.

The amount of neomycin utilized in the treatment of this patient was less than one-half that considered safe on the basis of experimental and clinical observation.^{1,2} Experimental evidence on the safety of intraperitoneal neomycin is based on studies in normal animals.⁷⁻⁹ It is definitely possible that peritonitis with increased vascularity of the peritoneal surfaces could greatly increase the absorption rate from the peritoneal cavity.

Neomycin is commonly used as a topical, prophylactic antibiotic during or following routine abdominal surgery. Although the quantities instilled at this time are usually not greater than two grams, the safety of this practice is also questioned, especially since respiratory arrest has also been de-

scribed following the administration of intraperitoneal neomycin.³

It is felt that intraperitoneal neomycin may have contributed to other instances of postoperative renal failure not as easily discernible as in the patient presented.

Summary

A case report exhibiting renal failure following the use of intraperitoneal neomycin in the treatment of acute bacterial peritonitis is presented. Based on a critical evaluation of the patient presented and a review of the literature, it is suggested that the dose of neomycin which can be safely placed in the peritoneal cavity, has not yet been determined.

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Surgical Approach to Esophagitis with Hiatus Hernia

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AT A gathering of a dozen surgeons, there are invariably twelve methods of treating the problem of peptic esophagitis compounded with hiatus hernia. In his address to the Arkansas Academy of Medicine in 1955, Dr. Alfred Kahn¹ concluded his thesis by stating, "The perfect surgical therapeusis for this condition is yet to be devised!" In the large majority of cases involving both conditions, patients are cured simply by repairing the hernia. This presentation concerns those with more severe esophagitis. For the moment let us consider the esophageal element.

Literary Background

In 1786, Sir John Hunter recognized and described esophagitis and ulcer of the esophagus. Schridde,² a German pathologist, in 1904 found heterotopic gastric glands in the esophagus in 66 per cent of postmortem examinations, one as high as the cricoid cartilage. Taylor³ found gastric mucosa in only six cases out of 900 examinations.

Most authors now agree that regurgitant gastric juice is the main etiologic agent.

Arroyave, Clatworthy and Wangenstein⁴ implanted 1.5 sq. cm. gastric mucosa in the esophagus of dogs with the nerve and blood supply intact. All dogs showed esophageal ulcerations, some as early as thirty days.

Ripley, Leary, Grindlay, and Seybold⁵ showed the same results by anastomosing the fundus of the stomach to the distal esophagus through a prepared defect in the diaphragm. Their experimental operation was somewhat similar to the Grondahl operation for cardiospasm. They also found esophagitis following esophago-gastrostomy. Colonel Palmer⁶ at Walter Reed Hospital, on the other hand, is adamant that the acid peptic factor is not the primary inciting factor in esophagitis, and maintains that the mucosa is not damaged primarily, but is secondary to an injured lamina propria. He offers no surgical correction.⁶

Wangenstein and Leven⁷ have held that three-

fourths resection of the stomach is an effective method of treatment. They favor bougienage pre-operatively and postoperatively if necessary. Ripley

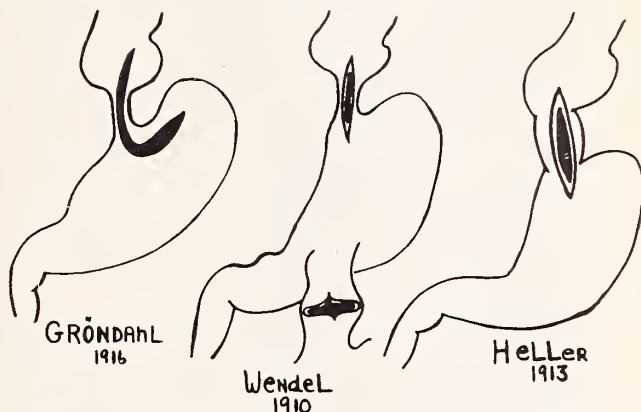


Fig. 1. Schematic drawings of the three esophagoplastic operations. The Grondahl and Wendel procedures involve complete wall incision with subsequent repair to enlarge esophagogastric junction. The Heller procedure is an incision down to the submucosa.

and his group⁵ do not agree that three-fourths resection protects the experimental animals from esophagitis. Sweet favors resection of the upper part of the stomach with esophagoantrostomy. Wangenstein, Clatworthy, and Arroyave² in their studies found that neither the sleeve resection nor the Bilioth II protected against esophagitis in the esophageal gastric implant animals.

In regard to the use of vagotomy in this dilemma, Geever and Merindino⁸ concluded after a short series of dogs that vagotomy combined with the Heller or Grondahl procedure was an unfortunate combination; if anything, it aggravated the esophagitis. However, they did not do any type of "drainage" operation; they assumed it would not work on the basis of previous work. Brackney, Wangenstein et al,⁹ on the other hand, found that a Heller or Wendel operation with vagotomy and pyloroplasty did not result in histamine induced esophagitis (Fig. 1).

The hiatus hernia repair has been bypassed thus far, as it seems to be the lesser of the two evils. The majority of surgeons seem to favor the

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thoracic approach, but a few feel the abdominal method is preferable (Fig. 2). The most recent addition to these techniques is one offered by Nissen¹⁰ of Switzerland, which does not interfere

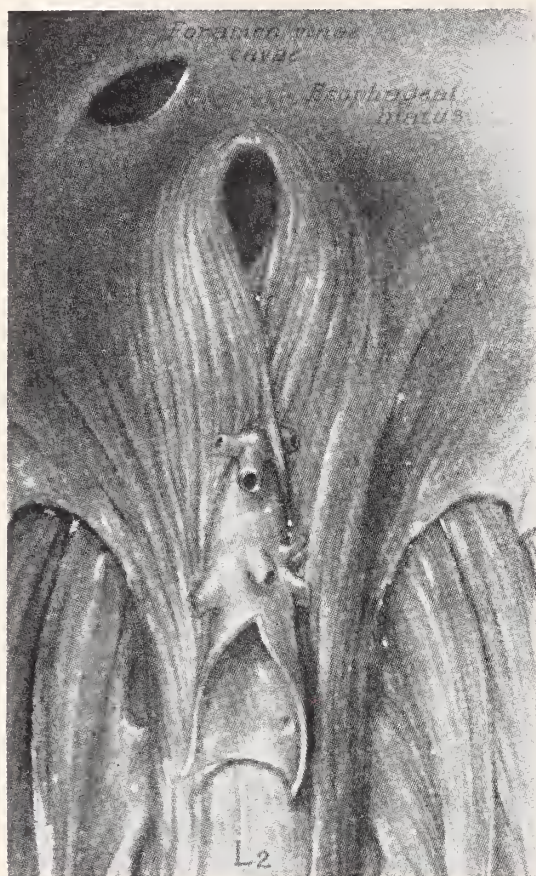


Fig. 2. Esophageal hiatus shown with crura of the diaphragm forming the margin. The muscle can be approximated quickly to effect an adequate repair of the hernia.

with the hernial sac. He simply pulls the stomach into the peritoneal cavity and attaches it with rectus fascia strips to the anterior rectus fascia. He then stitches the anterior stomach wall to the parietal peritoneum at the incision. He calls the operation a gastropexy. He has operated on five patients, all of whom were of advanced age.

The question is, where do we go from here? When the internist has exhausted his dietary and drug therapy, when the patient still has crippling heartburn, when hernia is present, and when stricture or ulcer are evident we must offer some surgical therapy. Recently, we have treated two such patients with hernia repair from below, bilateral vagotomy and pyloroplasty (Fig. 3). The details of the operation need no laboring. A mid-line umbilicus to xiphoid incision is used. The xiphoid may be removed for added exposure, and

a minimal split of the sternum may be necessary in obese individuals. The triangular ligament of the liver is cut, and the left lobe of the liver retracted medially. The esophagus is easily dis-



Fig. 3. Schematic representation of the three phases of the operation: (a) crura brought together to repair the hernia; (b) vagi cut bilaterally; (c) Heineke Mikulicz pylorotomy.

sected from its peritoneal attachments and displaced anteriorly with a Penrose sling. The vagus nerves at this point are cut, and all of the ramifications are stripped from the esophagus to be sure of cutting each and every fiber. The hernial sac is removed and the crura closed behind the esophagus with 2-0 silk, taking generous bites with each stitch. The esophagophrenic ligament is then reconstituted with a few 4-0 silk stitches from the outer wall of the esophagus to the peritoneum and the underlying ligament, and finally the Heineke-Mikulicz pylorotomy is carried out with the usual 3 to 4 inch longitudinal incision with transverse closure. It is not possible in the space allotted to describe the different types of esophageal hernia nor to touch on the concepts of Allison regarding the esophagophrenic ligament.

Case Reports

The first case is that of a married man, aged thirty-seven, who consulted his doctor for severe "heartburn" of five years' duration. He had regurgitation, inability to eat solid foods, and a gradual aggravation of symptoms to the point of difficulty with liquid foods (Fig. 4). He tried every conceivable antacid, antispasmodic and tranquilizer, but his situation was deteriorating. The gastric analyses with histamine are shown in Table I.

He also had occult blood in the stool on two examina-

tions. The preoperative diagnosis was esophagitis with hernia. Following surgery, he presented no problem aside from transient diarrhea controlled easily with paregoric. He now has no trouble with diet and considers himself completely cured. He is back to full-

as the first patient in July, 1956.

She was as gratifying as the first patient, but after discharge developed a mild anxiety with loss of appetite and regurgitation. Repeat barium swallow showed a defect in the esophagus just at the operative area (Fig.



Fig. 4. Preoperative esophagogram (*two upper views*) show upper third of stomach herniated into chest, accompanied by esophageal stenosis. Post-operative esophagogram (*two lower views*) shows reduced hernia with adequate esophageal lumen.

time work and recently drank eight bottles of beer at a bowling party without adverse effect.

The second case is that of a married woman, aged forty-seven, who had an identical story, with radiation of the subzyphoid pain to the back and shoulders (Fig. 5, *above*). Her gastric analyses with histamine are shown in Table II. This patient had the same operation

5, *lower left*). Esophagoscopy was done and an ulcer could not be confirmed, nor was esophagitis found. It is possible the defect was produced by one of the stitches from the esophagus to the peritoneum. The patient responded to a bland diet with an antacid and the deformity seems to be less prominent in subsequent x-rays (Fig. 5, *lower right*).

TABLE I. GASTRIC ANALYSES (E.R.)

Time	Preoperative	Postoperative
Fasting	0	6
15' after histamine	14	24
30' after histamine	56	20
45' after histamine	45	3
60' after histamine	107	0
75' after histamine		0

TABLE II. GASTRIC ANALYSES (E.F.)

Time	Preoperative	Postoperative
Free		0
20' after histamine	55	0
40' after histamine	86	20
60' after histamine	81	25

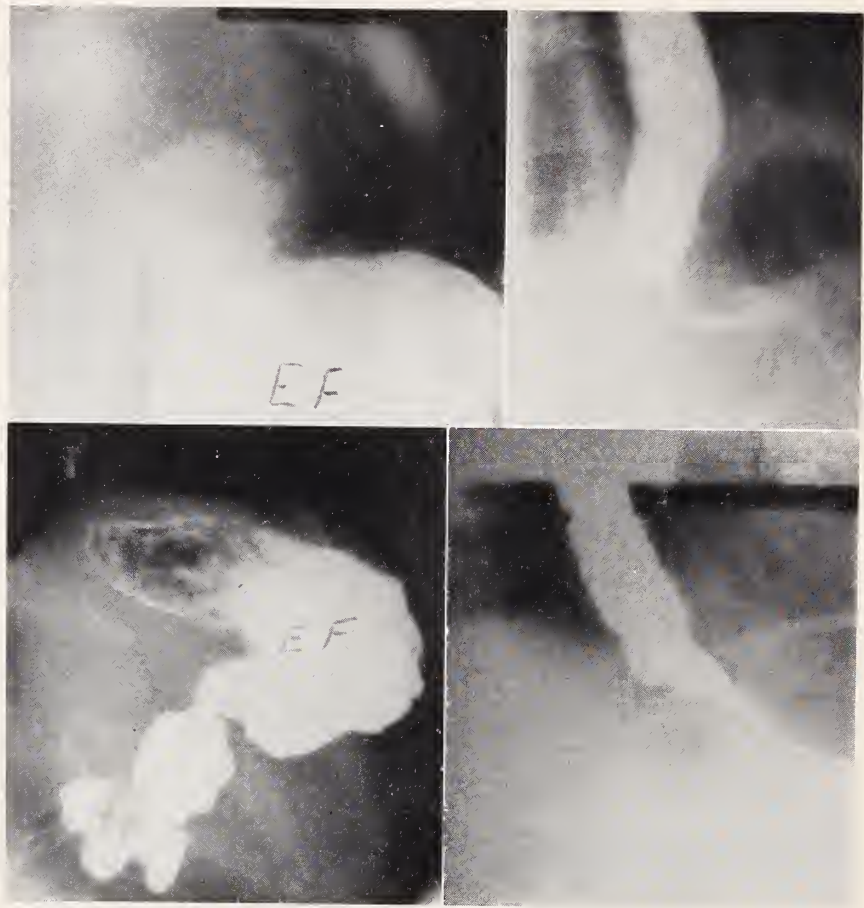


Fig. 5. Two views (*above*) of the hiatus hernia also demonstrate narrowing of the esophagus just above the esophagogastric junction. Picture on the right shows cardia filled with gas. (*Lower left*) Small fleck of barium can be seen just above the diaphragm—thought to be small ulceration. Subsequent esophagram revealed this defect to be gone. (*Lower right*) Original ulceration area is now clear, and there is adequate esophagogastric junction.

Perhaps repair of the hernia repair alone would have sufficed in these two cases. In the great majority of instances, this is certainly the case, but in view of the pronounced esophagitis, it seems unlikely. Since “drainage” operation prevents the puddling of gastric content, since the acid content has been markedly decreased, since a pitchcock mechanism has been restored, and since the extra procedure adds very little time to the procedure, it seems that this operation has some merit.

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(Continued on Page 599)

Treatment of Congestive Heart Failure

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ONLY a few years ago, recognition that a patient was having congestive heart failure meant that diagnostic efforts with respect to his problem could come to an end. With few exceptions, the specific cause of heart failure was unimportant from the standpoint of treatment, since essentially the same routine measures applied to each patient. The fund of information regarding heart failure and its treatment fortunately has increased so that management of the problem now must be much more exacting and intimately involved with diagnostic studies. The physician of today no longer is permitted the luxury of calling congestive heart failure a diagnosis but must accept it as a symptom complex and as a challenge to his diagnostic acumen. To a large degree, the clinician owes to the cardiac physiologist and the cardiac surgeon the responsibility for establishing an exact anatomic and functional diagnosis in all cases of congestive heart failure. The joint efforts of these specialists have led to the alleviation and cure of many types of heart disease that hitherto could only be palliated. In view of this added responsibility, the application of special diagnostic tools or the obtaining of special consultation becomes a necessity for certain patients in whom the anatomic diagnosis is not readily apparent.

Cardiac Diseases of Surgical Interest

Examination of the patient with the possibility in mind that surgical treatment may be effective is now a necessity in an increasing number of types of heart disease (Table I). The list of surgically correctible congenital malformations has grown greatly in the past year or so with the availability of an adequate mechanical bypass for the extracorporeal support of the patient's circulation during operation. In rheumatic heart disease, the benefit of surgical relief of mitral stenosis is generally known; in addition, selected patients who

have aortic valvular disease, both stenosis and insufficiency, are being helped by a surgical approach, and surgical methods for mitral insufficiency are being developed that show promise

TABLE I. TYPES OF HEART DISEASE
POSSIBLY AMENABLE TO SURGICAL TREATMENT

Congenital
Coarctation of aorta
Patent ductus arteriosus
Atrial septal defect
Ventricular septal defect
Persistent common atrioventricular canal
Tetralogy of Fallot
Pulmonic stenosis
Anomalous pulmonary venous drainage
Transposition
Subaortic stenosis and aortic valvular stenosis
Aneurysm of sinus of Valsalva
Rheumatic
Mitral stenosis
Aortic stenosis
Mitral insufficiency
Aortic insufficiency
Tricuspid stenosis
Constrictive pericarditis
Tumors of the heart
Secondary heart disease
Systemic arteriovenous fistula
Pheochromocytoma
Aldosteronism

of correcting that valvular defect. Tricuspid stenosis, a relatively uncommon lesion, can be approached surgically on the right side of the heart in a fashion similar to the operation for mitral stenosis on the left. Constrictive pericarditis is a surgically amenable lesion to be considered as a possible diagnosis in any patient who has the findings of failure of the right side of the heart, especially if ascites is present. In a few instances, it has been possible to diagnose atrial tumors by means of angiocardiography; these lesions should lend themselves to surgical removal, utilizing new methods of operative approach.

Operative intervention is indicated for systemic arteriovenous fistulas that are putting strain on the heart. An uncommon cause of hypertensive heart failure is the pheochromocytoma, a functioning tumor of the adrenal medulla. This possibility especially should be considered in persons who have intermittent hypertension or those with sustained hypertension who exhibit excessive sweating, tachycardia, glycosuria or other unusual features. The physician should be prepared to

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TABLE II. TYPES OF CONGESTIVE HEART FAILURE THAT LEND THEMSELVES TO SPECIAL MEDICAL TREATMENT

Hypertensive heart disease
Thyrocardiac disease
Myxedematous heart disease
Beriberi heart disease
Bacterial endocarditis
Acute rheumatic carditis

conduct tests to confirm or eliminate the diagnosis. Positive results of such tests, especially if reproducible, are evidence for surgical exploration of the adrenal gland. Similarly, a few cases of hypertension secondary to aldosteronism caused by a functioning adrenal cortical tumor have been reported.¹ Since this syndrome is associated with decreased serum potassium, values for this ion should be determined in hypertensive patients who have polyuria or periodic weakness.

Cardiac Diseases Amenable to Special Medical Measures

The internist or general practitioner also encounters patients who have certain diseases that produce heart failure in whom he can, by proper treatment and advice, greatly reduce the burden of extra activity of the heart (Table II). Essential hypertension causing congestive heart failure now can be controlled to the benefit of the patient by use of a variety of effective drugs, including the Rauwolfia preparations, hydralazine and the ganglion-blocking agents. The plan of attack with these drugs must be individualized depending on the severity of the hypertension and its response.

Heart failure associated with hyperthyroidism lends itself to specific therapy, which consists mainly today of the eradication of the hyperthyroidal state by use of radioactive iodine. If such treatment is not available, use of the antithyroid drugs may be substituted. Although some controversy exists concerning whether heart failure ever is caused by myxedema alone, it can occur in the presence of hypothyroidal states and the judicious use of desiccated thyroid will alleviate the symptoms. Heart disease caused by beriberi is almost unknown in this part of the country. It can, of course, be treated specifically by use of thiamine.

Bacterial endocarditis may precipitate heart failure in an otherwise compensated heart with valvular deformity, and it requires specific antibiotic therapy based on the causative organism and its sensitivity to various drugs. When congestive heart failure occurs in a child or young adult as a con-

TABLE III. NONSPECIFIC MEASURES IN CONGESTIVE HEART FAILURE

Rest program
Reduction of body weight
Correction of anemia
Combatting of infection
Judicious sedation
Production of hypometabolic state

sequence of acute rheumatic carditis, the toxicity as manifested by fever, pain and tachycardia can be alleviated by the use of cortisone and related substances.

The beneficial effects that can be accomplished in selected types of heart disease re-emphasize the value of specific diagnosis to allow the application of specific therapy.

Nonspecific Measures

Nonspecific therapy is also available for patients who have congestive heart failure, both those for whom specific treatment is not known at present and those in whom it is desired to bring about compensation in conjunction with specific treatment. Since the presence of congestive heart failure implies that cardiac reserve is lost and that the heart no longer is able to maintain an effective output, certain general considerations may be applied for the purpose of reducing cardiac work irrespective of drug therapy (Table III). First, the patient must know that he no longer can pursue full and vigorous activity but must secure increased rest and follow a life of moderation. These measures should be carefully outlined by the physician as based on firsthand knowledge of the patient's work and habits. A dietary schedule for the removal of excessive weight is a necessity for the obese patient as a means of reducing cardiac work. Anemia causes a compensatory increase in cardiac output, with resultant overwork; the anemia should be corrected medically or surgically, with replacement of blood if necessary. Similarly, a patient with decreased cardiac reserve frequently is plunged into failure as a consequence of infection, respiratory or otherwise, which accentuates cardiac work. This extra burden on the heart should be removed by the use of suitable antibiotics or chemotherapy, or other indicated measures.

The judicious administration of sedative drugs is of importance both to allay anxiety and reduce overactivity on the part of the patient with heart failure. It is of benefit in his program of rest. The choice of medication and the dose are individual-

TABLE IV. MANAGEMENT OF ACUTE PULMONARY EDEMA

Morphine sulfate
Oxygen
Tourniquets or bloodletting
Digitalis
Measures to reduce blood pressure
Aminophylline
Antifoaming agents

zed, depending on the patient as well as the prescribing physician. Narcotics should be avoided when the condition is chronic. Finally, as a non-specific measure, consideration occasionally should be given to the production of a hypometabolic state, as emphasized by Blumgart and Freedberg.² The production of hypothyroidism by means of radioactive iodine has its indication for the patient whose chronic congestive heart failure cannot be controlled otherwise despite careful medical management.

Treatment of Acute Pulmonary Edema

Acute pulmonary edema, a manifestation of severe left ventricular failure, is a true medical emergency that may occur as the first evidence of heart disease or, in the patient being treated for chronic congestive failure, as a result of any factor causing sudden increase in cardiac work. Although many hiatuses are present in the knowledge of the mechanism of acute pulmonary edema, the management of this state is fairly well established (Table IV).

Morphine sulfate traditionally is considered as a specific in the emergency care of the patient with acute pulmonary edema. It should be used in all such cases unless there is specific contraindication, such as known intolerance to the drug, or unless the pulmonary edema is related to cerebral disease or chronic pulmonary disease. It may be administered subcutaneously in doses of one-sixth or one-fourth grain; if urgency is indicated, similar doses should be given slowly intravenously. It is probably wise to give atropine sulfate at the same time. Morphine has the effect of alleviating anxiety and disrupting harmful reflexes that overstimulate the respiratory mechanisms. The need of oxygen is indicated by the dyspnea and cyanosis. Oxygen should be given preferably by means of a face mask to insure high concentration. If a mask is not tolerated, use of a tent or nasal catheter may be necessary. Clinical data show that the act of breathing against a pressure of 3 to 6 cm. of water benefits the patient by decreasing the transudation of fluid into the lungs.

When evidence exists of increased venous pressure and venous return to the heart, the interruption or slowing of venous return by the application of tourniquets to the extremities or by phlebotomy and removal of 500 ml. of blood is beneficial. When tourniquets are used, they should be applied to the proximal part of the extremity at or slightly less than diastolic pressure in order to permit entrance of arterial blood into the extremity but to inhibit venous return. Tourniquets should be applied to only three extremities at a time and should be rotated every fifteen minutes.

Rapid digitalization by the intravenous route has its greatest function in the management of acute pulmonary edema. Although in the past, the rapidly acting cardiotonic drugs, including ouabain and other preparations of *Strophanthus*, enjoyed wide use, lanatoside C and other glycosides of *Digitalis lanata* (Digoxin) appear to be the drugs of choice at present. If the patient has not received digitalis recently, 1.0 mg. of either of the two last-mentioned drugs may be given slowly intravenously as an initial dose; an additional dose of 0.5 or 0.6 mg. after two to four hours may be infused if it is needed. For the patient who has received digitalis previously and is believed to be near digitalization, doses of 0.2 to 0.4 mg. of lanatoside C can be given initially and repeated in two to four hours unless evidence of toxicity from digitalis occurs. After recovery from pulmonary edema, the patient should receive one of the longer-acting oral preparations of digitalis. When acute pulmonary edema results from a severe hypertensive crisis, it may be lifesaving to reduce blood pressure rapidly by the careful parenteral administration of a potent antihypertensive drug. The alkaloids of *Veratrum*, as well as hydralazine and hexamethonium, have been used intravenously, and reserpine is effective by intramuscular injection. Use of these agents requires that the patient be hospitalized under constant supervision and that the cautions, contraindications and directions which accompany these drugs be carefully adhered to.

Aminophylline given intravenously has a place in the management of pulmonary edema unless hypotension or shock is present, in which case it should not be used. Its beneficial effect apparently results from bronchial dilatation. The slow intravenous drip method, in which 0.5 gm. of the drug is given in 100 ml. of a 5 per cent solution of dextrose, is safe and effective.

The use of ethyl alcohol vapor and the aerosolization of solutions of silicone have been introduced recently in the management of acute pulmonary edema for their antifoaming effect.³ These agents cause reduction of the frothy sputum by their effect on surface tension. They are administered by allowing oxygen to bubble through the agent between the oxygen tank and the mask or tent.

Management of Chronic Congestive Heart Failure

Chronic congestive heart failure typically is manifested by pulmonary congestion, edema of the legs and abdominal wall, and the presence of free fluid in the serous cavities. The patient is best hospitalized to permit the accomplishment of several goals (Table V). First, the specific cause can be determined more easily in the hospital than at home; secondly, hospitalization insures adequate rest; thirdly, maximal therapeutic efforts are more easily accomplished in a hospital; finally, by pursuing a cardiac regimen in the hospital, the patient learns the details of diet and other important factors that will help him maintain cardiac compensation in the future.

Since Withering reported the experience of the old lady from Shropshire, there has been no more specific therapy for the failing heart than digitalis in one form or another. Rapid intravenous digitalization usually is not necessary in chronic congestive heart failure. The relative advantages and disadvantages of the various preparations of digitalis in common usage today, which include digitalis leaf, digitoxin, Digoxin, gitalin and, to a lesser degree, several others, will not be discussed here. Basically, all such preparations have similar cardiotonic properties, and it is most important that the physician familiarize himself thoroughly with one or two preparations and utilize them rather than attempt to use all those available. A patient who is well controlled on a certain drug should not be subjected to change of medication at the whim of the physician. The dosage of the various preparations is widely publicized and needs only the comment that individualization is necessary; unhappily, the method of trial and error is still needed to insure an adequate effect from digitalis without toxicity. The physician further is obligated to impress on his patient the fact that digitalis cannot be used haphazardly and have an optimal effect. Unnecessary expense and disability occur far too frequently because the physician fails to advise the patient that digitalis will be necessary

TABLE V. MANAGEMENT OF CHRONIC CONGESTIVE HEART FAILURE

Hospitalization
Digitalization
Restriction of sodium
Diuresis
Mechanical removal of fluid
Administration of anticoagulants

for him always and that he must continue to refill his prescriptions.

To relieve the patient of the accumulated fluid restriction of sodium occupies a key role. For the patient with severe heart failure who accumulates fluid readily, a diet permitting only 0.5 gm. of sodium per day should be carefully outlined, preferably by a hospital dietitian or with the aid of printed material. When the failure is mild and easily controlled, a diet containing 2 gm. of sodium can be permitted. Again, the patient must be impressed with the necessity of continuous observance of dietotherapy.

A large number of diuretic agents are available for the management of dropsy. The use of diuretics only after severe symptoms of retention of fluid have developed is wrong. Instead, a program should be set up whereby use of such agents keeps the patient free of excessive fluid and comfortable, rather than in a constant state of being partly waterlogged. This is done best by initially hospitalizing the patient to obtain maximal benefit from diuretic therapy and instructing him to be alert for reaccumulation of fluid by weighing himself to detect such retention before it reaches the point of producing pulmonary congestion or overt edema.

The most effective diuretic for congestive heart failure uncomplicated by renal insufficiency is one of the organic mercurial agents administered parenterally. Mercaptomerin (Thiomerin), which may be used subcutaneously, or mersalyl (Salurgan)-theophylline or meralluride (Mercurhydrin) given intramuscularly or intravenously can be given daily or every other day in doses of 1 or 2 ml. during the patient's hospitalization until the "dry weight" is obtained. In the case of stubborn retention of water, ammonium chloride can be used in daily divided total doses of 6 to 12 gm. to potentiate the effectiveness of the mercurial. When cardiac compensation has been obtained and the patient is free of excessive fluid, the maintenance of this state will require a wide variation of diuretic therapy. When the disease is mild, restriction of sodium and the use of digitalis usually prevent

accumulation of fluid. In other cases, the intermittent utilization of orally administered diuretics, such as acetazolamide (Diamox), chlormerodrin (Neohydrin), mercumatilin (Cumertilin) or ammetradine (Mictine) in doses found by clinical trial to be tolerated and effective will prove satisfactory. In the more severe degrees of chronic congestive heart failure, the regular use of mercurials by the parenteral route two or three times weekly, together with the regular administration of ammonium chloride, will be necessary. The modern diuretic management of congestive failure implies the outlining of a program that will keep the patient clinically in cardiac compensation by means of the most conservative treatment from the standpoint of discomfort and expense to the patient; such a program, of course, demands careful individualization. The xanthine drugs, particularly aminophylline, can be used alone as mild diuretic agents, particularly in the form of rectal suppositories, or they can be used also to accentuate the effect of the mercurial when they are given intravenously.

Two complications that may appear during use of mercurial diuretics for severe resistant chronic congestive heart failure have been publicized recently and are worthy of brief comment. They are intractable heart failure complicated by the so-called low-salt syndrome and the development of cardiac arrhythmia. In the former, low values for serum sodium and chloride are found, together with azotemia and retention of fluid. Whereas attempts at improving the patient's condition by replacing sodium chloride rarely have been effective, Rubin and associates⁴ recently demonstrated that restoration of the responsiveness to mercurials can be accomplished by using ammonium chloride and Diamox over a period of several days to produce hyperchloremic acidosis. When this electrolytic state was produced, the diuretic response to mercurials was restored and the patient improved.

Cardiac arrhythmia in the digitalized patient during mercurial diuresis is a manifestation of digitalis toxicity secondary to depletion of potassium. Brown and Levine⁵ demonstrated the occurrence of paroxysmal auricular tachycardia with block as a specific arrhythmia in this syndrome. This arrhythmia can be interrupted and the former rhythmic mechanism restored by giving potassium chloride by mouth in 2-gm. doses every two to four hours or four to six doses or by the intravenous administration of 40 mEq. of potassium chloride diluted in

1 liter of a 5 per cent solution of dextrose.

Mention should be made of the mechanical removal of fluid. Massive pleural effusion and ascites are frequently resistant to mobilization, particularly in cases of intractable disease in which intensive diuretic therapy aggravates electrolytic imbalance. In such instances, thoracentesis and abdominal paracentesis can give immense relief to the waterlogged patient. Infrequently, drainage of fluid from dependent parts of the body by means of Southey's tubes or use of hypodermic needles has a place, particularly for persons sensitive or resistant to mercurial diuresis.

Anticoagulant therapy has a role in the management of selected patients with congestive heart failure. This treatment should be instituted in the presence of thrombo-embolic phenomena and in cases of intractable disease in which the presence of repeated small pulmonary emboli is suspected. The frequency with which pulmonary and peripheral thrombosis and embolization occur during active therapy for congestive failure might justify the use of anticoagulants as a more or less routine measure during hospitalization, especially when extensive anasarca or auricular fibrillation is present. Unfortunately, the association of complicating renal and hepatic dysfunction often contraindicates such prophylaxis.

Summary

The modern management of congestive heart failure demands that definitive anatomic and physiologic appraisal of the etiologic basis of the cardiac lesion be accomplished. This responsibility is necessary for the adequate selection and treatment with surgical or specialized medical measures of those patients whose cardiac disease lends itself to specific therapy.

In the nonspecific medical management of patients with congestive heart failure, individualization, although time-consuming, is essential in determining the dietary, cardiotonic and diuretic treatment for each patient. That program, as eventually established, is one which should be neither too confining nor too liberal for adequate control of the patient's individual needs.

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The Masonic Memorial Hospital and the Cancer Problem

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THE CONTINUED meeting of the Masonic Orders upon the campus of the University of Minnesota is symbolic, I am certain, of the spirit of mutual helpfulness which permeates the roots and fabric of our respective organizations. In the final analysis, the actions of nations and organizations express merely the sentiment of a few individuals, who because of qualities of leadership, speak for the groups. The Samaritan quality of man helping man is a celestial attitude. Our meeting here already, I feel, has set in motion a continuing process which will cement a strong bond of trust and mutual sympathy which will redound to the mutual advantage of both organizations, multiplying the fruits of our joint labors in making this a better community in which to live. The University takes great pride in its association with the Masonic Orders, which have come forward to lay an important gift upon the altar of this community—a hospital to provide a home and suitable medical care for patients in the advanced stages of cancer.

In any enterprise, there are two strong allies which afford great help and strength in any undertaking: I speak of cause and need. Cancer is a great cause, and there is important need for the hospital which representatives of the Masonic Orders have proposed to provide. In fact, there is a crying need for this type of institution throughout the breadth and length of this great land. As Dean Diehl said, other areas in Minnesota would do well to provide this type of facility for the care of patients with advanced cancer. Present provisions to meet this need in the state of Minnesota are grossly inadequate.

Another great voluntary organization in this state, the Veterans of Foreign Wars, is proposing to build also on the campus of the Medical School a Clinical Research Facility for the express purpose of fostering studies on patients with cancer. This

additional small research unit to be placed in immediate juxtaposition to the Masonic Memorial Hospital, it is hoped, may provide window through which sunlight and hope will come; fruits of research to bring aid to the flagging spirit of many a patient afflicted with cancer. In the life of every family, there are periodic stormy currents, occasioned by illness, which wreck havoc upon plans and contemplations of the pleasantness of life. Such a foe is cancer. It may come at an age of life; however, increasing years is its commonest denominator.

The word fanaticism crept into our language during the religious persecutions of the seventeenth century. If a fanatic can be described as one who continually harps on a subject and never changes his mind about it, I fear that the facility with which the subject of cancer and its problems come to my lips brings me within the range of that definition.

In 1954, more than 230,000 persons died of cancer in this country. In 1957, that figure was approximately 270,000. One of the great benefactions of medicine to mankind has been longer life, and as more people live to be old, the toll from cancer will be greater. Today deaths from cancer in the United States each year approximate half the population of the city of Minneapolis. Of Minneapolis residents, nearly one thousand will die of cancer in 1957—about three times as many people as are gathered here today, in the interest of providing added protection against this dreadful scourge.

When will all this carnage stop? When will the mortality from cancer follow the pattern of improvement which has characterized the decline in mortality from infectious diseases? At the turn of the century, tuberculosis and other prevalent infectious diseases took the largest toll of lives. Today, those ailments no longer hold the serious threat which they once posed. Today, heart disease, cancer and accidents are responsible for approximately 80 per cent of all deaths. Cancer alone accounts for somewhat less than 20 per cent

From the Department of Surgery, University of Minnesota.

Remarks made at "Hit the Million Mark" Luncheon of the Masonic Orders held at the Coffman Memorial Union, April 13, 1957.

all deaths. In other words, somewhere between one in five or six persons will die of cancer.

Today, we are curing approximately one-third of all patients found to have cancer. One of the startling developments in the cancer field has been the decline in deaths from cancer of the cervix and the uterus. Over the period of the last ten years, the Metropolitan Life Insurance Company records a 30 per cent decline in deaths among its workers from uterine cancer—confirmation of the well-known fact that early diagnosis leads to improved results. Even in so devastating a malignancy as cancer of the stomach, our experience at the University Hospitals indicates that of patients who come with localized cancer of the stomach, which has not spread to lymph nodes, 70 per cent can be cured by operation. The truth of the matter, however, is that, the ultimate cure rate of cancers of the stomach seen in our clinic is only a little better than 12 per cent. It is the long, silent interval which we need to fear in cancer. That is one of the reasons that the work sponsored in our University Cancer Detection Center, by the Minnesota State Medical Society, and the Minnesota Division of the American Cancer Society has proved so fruitful. Of asymptomatic patients coming there, one in thirty-six has been found to have a cancer. And of those having such asymptomatic cancers, the cure rate is high, for as we have learned to know, the length of the silent interval, when patients have no symptoms from cancer, is in the area of twenty months.

If the Minnesota State Medical Society and the Minnesota Division of the American Cancer Society were to sponsor jointly a program under which every person past forty-five years of age were to report to his physician for an annual check-up, submitting to examinations prescribed by joint committees of those two groups, I believe that our mortality record from cancer in Minnesota would improve. Certainly, an annual proctoscopic examination could succeed in recognizing the precursors of cancers of the rectum and the lower reaches of the colon when something more definitive could be done to bring about more frequent cures of such cancers than is our experience now. In fact, an experience like that reported by the Metropolitan Life Insurance Company for cancer of the uterus could then very well happen with cancers of the rectum and lower colon, too. Today in the United States the mortality from cancer of the rectum and colon together exceeds deaths

from cancer of any other organ. The reason: cancer of the colon and rectum is frequent in both men and women. Why not an annual birthday check-up for every Minnesotan past forty-five years of age?

Among nations and individuals, victories are not won by vanquishing our enemies, but by understanding them. In a disease, on the contrary, we may learn to overcome it before we understand it. I need only mention the experience of smallpox. Other instances could be cited. In cancer, we already know that finding the early case is the most important facet of the problem. The tubercle bacillus has been known for more than seventy-five years. Yet it took two decades of experience to appreciate the importance of that discovery to the extent that this knowledge could be utilized to the end that tuberculosis as a disease became less frequent. Today less than 3 per cent of deaths are occasioned by tuberculosis—in fact, the threat of tuberculosis as a serious disease has been won.

We already know that the important thing in cancer today is to get at the early case. In a number of cancers—lip, stomach, colon, rectum and breast—if the lymph nodes are not involved when the cancer is removed, the cure rate is high—in the area of 75 per cent. Until screening tests are available to inform us what kinds of things to look for as symptomatic of the presence of silent cancer, until then, we must continue to push cancer detection on a broad front throughout our country. Already, some progress has been made in cancer detection. I need cite only the work of Dr. George Moore of the Roswell Park Cancer Hospital in Buffalo here some years ago with fluorescein. It was when Dr. Moore was here as a surgical interne at our University Hospitals, almost ten years ago now, that he observed the great affinity of brain tumors for fluorescein. That was the first important objective screening test devised for the recognition of cancer. Professor Komei Nakayama of Chiba City, Japan, observed that many cancers had greater attraction for radioactive phosphorus than did normal tissues. Nakayama devised small Geiger counting tubes which he mounted on long, narrow, flexible tubes to be inserted into the esophagus and stomach to help aid the detection of cancers of these organs. My own associates, Drs. Donald B. Shahon and Joseph B. Aust, have confirmed Professor Nakayama's findings, and continue to explore means of detecting

cancers in these areas earlier than we now do. Drs. John F. Perry, Earl G. Yonehiro, Harlan D. Root and others are exploring radioactive ferrous citrate as a cancer detecting agent—working on the thesis that radioactive iron, which combines readily with red blood cells, would escape through mucosal leaks in viscera, such as the alimentary tract—thus serving to alert the examiner of the likely presence of an occult lesion.

Obviously, it is to research developments that we must look for improved knowledge concerning cancer. There are extensive studies now going on in many countries of the world, which are focusing interest upon causes of cancer and upon ways of controlling cancer that has gotten out of bounds. On this latter score, I can only say that whereas there are chemical and hormonal agents which will control several cancers for a period of time, the panacea for which every cancer investigator has been looking—an agent which will suppress cancer permanently—still has not been found.

In the summer of 1928, I had the opportunity of hearing a message, written by King George V of England, read as prelude to the First International Cancer Conference. In effect, the King said: "I note with interest that your object is research, both into the cure and causes of cancer. No doubt in the last resort the discovery of the cause is the only certain and absolute means of cure. But I am glad that you have not ignored the practical side of the problem. Remembering the thousands of sufferers from cancer, I feel that if your discussions lead to advance in diagnosis, treatment, or even palliation of the disease, this Conference will have justified itself and earned the gratitude of mankind." What a great prophet King George V proved to be. Those words could well have been employed to invoke each and every International Cancer Conference which has been held in the meanwhile.

A few days ago, I had the privilege of hearing Mr. A. A. Heckman, Executive Director of the Hill Family Foundation, speak to a group of surgeons on the philosophy of philanthropy. In tracing how philanthropy came about in this country, Mr. Heckman alluded to the observations of Alexis de Tocqueville, who spent approximately nine months in this country approximately 125 years ago. In writing a few years later (1835) of Democracy in America, de Tocqueville said, "The Americans are the most peculiar people in the world. You will not believe it when I tell you how

they behave. In a local community in their country a citizen may conceive of some need which is not being met. What does he do? He goes across the street and discusses it with his neighbor. Then what happens? A committee comes into existence and then the committee begins functioning on behalf of that need and, you won't believe this but it is true, all of this is done without reference to any bureaucrat—all of this is done by private citizens on their own initiative." In essence, that is how this great movement of your Masonic Order came into being: appreciation of the need; recognition of the importance of the cause; agreement upon a course of action, and something which many cancer sufferers must have dreamed and hoped for has come into being. Hope has been defined as a dream of the waking state. For the resolution of many of our problems, we need dreamers who can and will translate their vision into resolute action. That is what you have done. In these terms we could call Joseph the world's first banker.

On the occasion of his third visit to our surgical clinic, Professor Komei Nakayama from Chiba City, Japan, to whose research on cancer I alluded earlier, brought his attractive and delightful wife Mrs. Wangenstein, knowing of their plans thought a dinner was in order for the second night of their three days' visit to us. Late in the afternoon of the day of their expected arrival, we were notified by Northwest Airlines that travel conditions over the Pacific had been very poor and that our guests would be delayed approximately forty-eight hours. Thereupon, Mrs. Wangenstein, being inventive in such matters as many of you, I am certain, have been on similar occasions, invited a number of family relatives in for the dinner. Approximately twenty-four hours after this switch of plans, Mrs. Wangenstein was notified by the airline that our Japanese guests would arrive but perhaps a bit late for dinner—a circumstance which made it necessary to replan the dinner guests. Later that evening, when we were seated at dinner, the Japanese professor felt called upon to tell a story. He indicated how tired Mrs. Nakayama was after spending several days en route without having had the opportunity to stretch out on a bed. He explained how he had persuaded Mrs. Nakayama to come to dinner over protests of great fatigue. Said the Professor, "Everyone seeks the ideal life. I have three recommendations: get an American home: the best;

at Chinese food: none better; get a Japanese life: works hard, and no discussion!"

Nan Fairbrother begins her warm book on Men and Gardens by quoting a wise saying to be found in a book of Chinese proverbs: "If you would be happy for a week, take a wife; if you would be happy for a month, kill your pig; but if you would be happy all your life, plant a garden." We identify the happiest state of man in a garden. There is here the Lord provided him initially with every means for his sustenance, enjoyment and pleasure. Everything went well until man ate of the forbidden fruit of The Tree of Knowledge in the midst of the garden and was driven forth "lest he reach out his hand, eat also of The Tree of Life, and eat and live forever." Long years later Rudyard Kipling in the *Glory of the Gardener* commented as follows:

"Oh, Adam was a gardener, and God who made him, sees
"That half a proper gardener's work is done upon his knees."

There are probably few people among us, who, when contemplating the punishment of toil, sorrow and grief meted out to our ancestors have not looked back wistfully upon that original blissful state. Let me only remark, if work is the curse of Heaven, how pleasant could its blessings be? Many early writers have succeeded in conjuring up in our minds pictures of the Garden of Eden, from which Man was driven out, as an alluringly enchanting place of picturesque formal gardens like those of Versailles. However, John Milton, who saw with the penetrating eye of good taste, describes the Garden of Eden in *Paradise Lost* as a place of rugged and natural beauty, and in *Paradise Regained* he speaks of it as "Nature's own work."

Such a garden is the nature of the gift which you have come today to offer to the University and the peoples of Minnesota. Let us all till this garden well—yes, on our knees with a spirit of dedication and affection for our fellowman, who stands in need of our help.

Service was the Great Master's last instruction to his disciples. Every man in the cancer fight carries a cross, and no adversary is so formidable as he who carries a cross. Let us not put in down. A few years ago, one of our local newspapers carried the report of the two small brothers who were crossing the street; the larger brother was struck down by a careless motorist. The small

younger brother carried his burden to the sidewalk. When willing hands offered to relieve him of the burden, the boy said: "He is not heavy; he is my brother." The weight of supporting this noble activity of your Masonic Orders should not be wearisome. In fact, some of us may come to bring our burdens there.

It is not out of line, I think, to believe that this Masonic Memorial Hospital will bring new hope to many, and healing to some cancer sufferers. This hospital, together with Clinical Research Facilities of the Veterans of Foreign Wars to be placed by its side, can come, I believe, to catalyze an action to speed the day when cancer will no longer reign as one of the captains of death.

For every school child the story of Cinderella and Prince Charming and how "they lived happily ever after" still holds an especial fascination. As children once, what did you and I think this phrase, which rolls so pleasantly and easily off our lips, meant?—Well, I no longer remember. Do you? In any case, no lasting impression remains of the kind of life which I then pictured for Cinderella and her Prince Charming. Experience always tempers one's day dreams. But I can tell you what I think now: I would say it means acceptance, appreciation and enjoyment of things as they are with hope, reinforced by effort, that they will be better. The new Masonic Memorial Hospital, provided by the beneficence of the Masonic Orders, potentiated in turn by the Research Facility of the Veterans of Foreign Wars and with your help and mine, should make the lot of cancer sufferers somewhat better in the State of Minnesota.

The Cinderella and Prince Charming relationships of life are few indeed. And in so grim an aspect of life as cancer, the only facets of interest that can command our continued concern and attention are the bonds of service and sympathy. These, moreover, are the only solvents capable of absorbing and dissolving the distressing ailments of this troubled universe. In the auditorium of the world, when will these soft and mellow influences, more readily felt than heard, come to replace the harsh and noisy clash of armor and the flash of guns? Social progress unfortunately is painfully slow in this world. However snail-like the growth of knowledge in the cancer field is, it is altogether likely that we shall conquer cancer before we can learn to live in harmony and peace with our neighbors.

Loeffler's Syndrome (Eosinophilic Pneumonia)

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PROFESSOR Loeffler, of the Outpatient Medical Clinic of the University of Zurich, in 1932¹ first described the syndrome that now bears his name. At that time he reported on eight patients who had mild or absent clinical symptoms associated with lung infiltrates resembling the shadows seen in early tuberculosis. Eosinophilia also was present, with a slightly increased sedimentation rate. He concluded that, "If it is a case of pneumonia, then it must be a very special form of it."

In a report in 1936, Loeffler² stressed the fleeting character of the lung infiltrate, noting, "The main symptom is the x-ray shadow, which is of indefinite location and of indefinite spread, of variable structure, either homogeneous or patchy. The shadows may, however, be sharply defined and either unilateral or bilateral." He set forth four criteria for diagnosis of this symptom complex, namely (a) a roentgen shadow in the lung, (b) the observance of its fleeting behavior, (c) the accompanying blood eosinophilia, and (d) only slight impairment of the general health of the patient.

He stated that all the symptoms were gone in a few days to two weeks in the majority of patients, but that the condition occasionally may become chronic. During the period of pulmonary symptoms, transitory x-ray shadows in the lungs appeared to be much more serious than the signs and symptoms of the patient would imply. Eosinophilia up to 66 per cent was noted. Fever was generally low grade, not more than 100° F, but it sometimes reached 103° F. There was an irritative cough productive of thin sputum containing eosinophils, the cough sometimes accompanied by wheezing. The only physical findings consisted of occasional mild friction rub, crepitant râles, vesicular breath sounds, and mild or absent dullness. After resorption of the infiltrate,

a fine fibrous star-shaped scar may remain on x-ray.

By 1940, a total of 105 cases had been reported. From 1940 to 1955, reports of another 130 cases have appeared in the literature. Many more unreported and unrecognized cases undoubtedly occur.

Loeffler's original work stressed the mild clinical course of the disease, but subsequent reports have included some cases of severe septic disease persisting from several months to periods up to seven years. Vines and Clark³ and Schwartz⁴ made detailed reports of two instances of serious disease of long duration in which treatment with ACTH and cortisone appeared to be life saving.

The cause of eosinophilic pneumonia is not clear. Loeffler first considered it related to the tubercle bacillus or possibly an "erythema nodosum of the lung." More recently he and his associates⁵ suggested *Ascaris* as an etiologic agent.

The theory of allergy seems to be the most generally accepted one at present. When the condition is chronic, it is often associated with asthma. Bacterial allergy has also been mentioned. Elsom and Ingelfinger⁶ reported two cases in patients with chronic relapsing brucellosis. Gregory⁷ reported on one patient whose condition differed from that of others only in severity; autopsy disclosed periarteritis nodosa.

Several authors have suggested that the name "Loeffler's syndrome" be reserved for the simple transient pulmonary infiltration originally described. Crofton and co-workers⁸ suggested the term "pulmonary eosinophilia" to cover the broad group and to reserve the term "Loeffler's syndrome" for the mild transient form. Their classification is as follows:

Group I. Simple transient pulmonary infiltration, or Loeffler's syndrome. This includes cases in which the pulmonary infiltrate persists no longer than one month, with fever not more than 100° F. and an eosinophil count of at least 6 per cent.

Group II. Prolonged pulmonary eosinophilia without

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asthma. This syndrome usually lasts two to six months. The symptoms may be rather severe and there may be recurrences after some months of remission.

group III. Pulmonary eosinophilia with asthma. Many asthmatics with more or less permanent eosinophilia may be placed in this group when they have intercurrent pneumonia. However, a number of cases are reported in which the pulmonary findings are shifting and apparently similar to Loeffler's original description.

group IV. Tropical eosinophilia. In 1943, Weingarten⁹ reported eighty-one cases of pronounced eosinophilia with pulmonary infiltrates that he observed in India. Other reports of pulmonary eosinophilia associated with parasites would fall into this group. Eosinophilia is present at the onset of the disease rather than in the third or fourth week, as in most allergic disorders. Treating the parasitic infestation relieves all the symptoms, including the pulmonary findings.

group V. Periarthritis nodosa. Patients in this group are usually severely ill when x-ray evidence of pulmonary infiltration is present.¹⁰

Because of the benign nature of this syndrome, extremely few cases have become available for pathologic study. A report from the Mayo Clinic¹¹ in 1946 gave an excellent description with illustrations of the pathologic findings in a case in which asthma also was present. The authors concluded that the appearance was that of organized pneumonia with large numbers of eosinophilic leukocytes.

Buckles and Lawless¹² reported that microscopic study of an operative specimen they removed for suspected carcinoma disclosed scattered fibrosis with extensive eosinophilic infiltration, periarthritis and arteriolitis with eosinophilia.

Faison¹³ expressed the theory that the pulmonic infiltration represents atelectasis. He made the following statement: "Virus pneumonia may resemble Loeffler's syndrome more closely than any other condition mentioned. Not only is there a close similarity in the pulmonary changes demonstrated by x-ray examination, but there is also, in both conditions, a striking disproportion between the physical and x-ray findings. Patients with virus pneumonia, however, do not have eosinophilia, and the x-ray densities ordinarily do not shift."

The treatment has varied widely in the cases reported. Prior to the widespread use of antibiotics, such agents as autogenous vaccines, vermifuges, organic arsenicals, iodides, blood transfusions and epinephrine were used. More recently,

administration of most of the antibiotics, antihistamines and steroids has been reported.

The most consistent results have been obtained with ACTH and cortisone. One patient reported on by Herbert DeVries and Rose¹⁴ showed dramatic clearing of the pulmonary lesions and eosinophilia in forty-eight hours of ACTH therapy. Mark¹⁵ reported the use of epinephrine, blood transfusions and cortisone either singly or in combination in the treatment of twenty-three patients with pulmonary eosinophilia. Andrell and associates¹⁶ stated that a thirty-two-year-old woman who had had bilateral pulmonary infiltration with severe cyanosis and dyspnea for seven weeks showed dramatic improvement after three days of ACTH therapy. Schwartz⁴ made a detailed case report of a sixteen-year-old girl with an illness of eighteen months' duration who responded in one week to cortisone treatment. A relapse necessitated a second course of cortisone one week later.

One other case report by Vines and Clark³ is most interesting. A forty-one-year-old woman with a two and one-half months' history of severe pulmonary disease accompanied by asthma made a dramatic recovery after treatment with ACTH. She had received penicillin, aureomycin, streptomycin, chloromycetin and sulfonamides, and had been in an oxygen tent prior to ACTH therapy. After the second day of treatment with ACTH, the oxygen tent was no longer necessary and she was sent home sixteen days after use of ACTH was started. However, one week later, the x-ray again showed clouding, so she received ACTH for twelve more days. Her eosinophil count persisted at 12 per cent but all x-rays were reported normal one year after treatment.

Report of Case

A forty-six-year-old white woman came under my care on September 27, 1954, because of a severe cough, chills, fever and thoracic pain of ten days' duration. She was extremely pale and noticeably dyspneic. Her temperature was normal, and the only physical findings were expiratory rales at the base of the right lung.

Past history revealed "inflammatory rheumatism" at the age of twelve, "lung fever" every winter as a child, a cholecystectomy in 1945 and pneumonia three times since 1946. The only history of allergy was hives once at the age of twenty after she ate quantities of strawberries.

Leukocytes numbered 8,900 cells per cubic millimeter of blood; the value for hemoglobin was 13.7 gm. per 100 ml. Thoracic roentgenograms showed increased density of the right lower lobe (Fig. 1).

The patient was given one intramuscular injection

of 100 mg. of tetracycline, followed by 500 mg. of the drug given orally every six hours for the next twelve days. At that time, she had not improved clinically and had lost twenty-two pounds since the beginning of her

lungs continued to show increased density on the right and a larger area on the left (Fig. 2).

During the next five weeks, she received 1 gm. dihydrostreptomycin plus 10 mg. of Chlor-trimeton daily

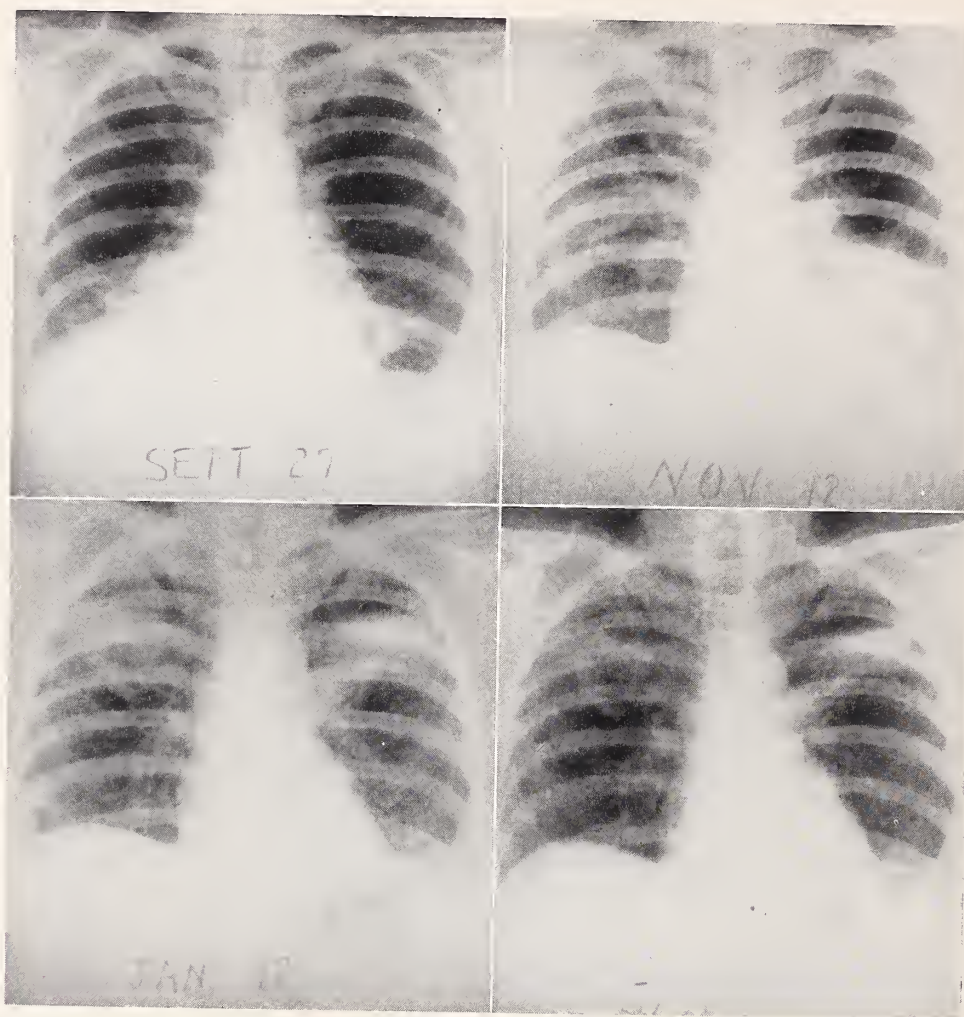


Fig. 1. (Upper left). September 27
Fig. 2. (Upper right). November 12

Fig. 3. (Lower left). January 17
Fig. 4. (Lower right). January 20, after forty-eight hours of cortisone therapy.

illness. The sedimentation rate (Westergren method) was 102 mm. during the first hour and roentgenograms showed increased density in the lower lobes of both lungs.

She was then given 400,000 units of penicillin and 0.5 gm. of dihydrostreptomycin daily. After four injections, severe local reactions occurred, so 10 mg. of chlorphenpyridamine maleate (Chlor-trimeton) was added to each injection. This therapy was continued for six days and had to be stopped because she began to get a localized reaction to the drugs in spite of the antihistamine.

The next medication tried was erythromycin, which was given in doses of 200 mg. every six hours for the next two weeks. At this time the leukocyte count was 7,600 and the sedimentation rate was 100 mm. She was raising considerable amounts of yellow mucoïd sputum. She had not lost any more weight and felt clinically somewhat improved. However, the x-ray studies of the

She appeared to improve both clinically and by x-ray findings during this time. The sedimentation rate decreased to 50 mm, but the thoracic films continued to show fairly large zones of increased density on both sides. On December 10, the leukocyte count was 9,300, and the differential count showed 47 per cent polymorphonuclears, 28 per cent lymphocytes, 23 per cent eosinophils and 2 per cent basophils. She was feeling much improved, had minimal cough, and had not had any fever for eight weeks. She had evidence of rather severe local reactions to the dihydrostreptomycin, which had developed in the last few days of therapy.

During the next ten days she was treated with postural drainage, rest in bed and vitamins with no noticeable change in her condition. A trial of 8 mg. of Chlor-trimeton given every eight hours for the next two weeks did not alter the situation. On December 30, the sedimentation rate was 77 mm, the leukocyte count was 6,000, and the differential count showed polymorpho-

nuclears 41 per cent, lymphocytes 55 per cent, eosinophils 3 per cent and basophils 1 per cent. Thoracic films displayed increased density in the right middle lobe and left lower lobe.

She was hospitalized on January 15, 1955, for further laboratory work and a trial of cortisone. Results of a Mantoux test and agglutination tests and cultures for *Brucella* were negative. Several stool specimens were negative for ova and parasites. The sputum showed no eosinophils or fungi. The sedimentation rate was 84 mm. Blood counts and urinalysis were normal. Roentgenograms of the thorax showed decreasing density on the right and increasing density on the left in the subclavicular region (Fig. 3).

Administration of 200 mg. of cortisone per day was begun on January 18. Two days later, the thoracic films showed dramatic improvement. The clouded zone on the left was 50 per cent less dense and the clouded zone on the right was only a faint shadow (Fig. 4). Roentgenographic improvement continued and no new areas of increased density were noted. She received 200 mg. of cortisone daily for twelve days, after which the dose was gradually reduced to 50 mg. daily. Thoracic roentgenograms on February 11, 1955, showed both lung fields to be completely clear. Use of cortisone was discontinued by the next week. The sedimentation rate gradually returned to normal in three months. The patient has had frequent normal thoracic roentgenograms since then and has remained clinically well to the present time.

Summary

A case of Loeffler's syndrome associated with prolonged pulmonary eosinophilia without asthma has been presented. After three and one-half months of failure of therapy with most of the antibiotics, a dramatic response was obtained within forty-eight hours after use of cortisone was begun. Administration of cortisone was continued for a total of three weeks, and the patient has continued to remain well to the present time.

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ART AS WELL AS SCIENCE OF MEDICINE IMPORTANT

A thoughtful reminder from a Toledo, Ohio, physician has emphasized that the "art" of medicine should not lose its important place as a result of the giant strides achieved in the "science" of medicine.

Both art and science play their respective, indispensable roles, said Dr. Clarence E. Hufford in a recent issue of *Radiology* (March, 1957).

Some of Dr. Hufford's other conclusions:

... The many inroads being made on private medical practice, of social and economic origin, must make us ever more cognizant of our obligations to the patient. The radiologist who considers himself a medical clinician must exercise the functions of the clinician. In no sense

does meticulous care in radiographic procedure lessen his clinical obligation.

... The sacred patient-physician relationship, which has been stressed in recent years, must still be guarded most religiously in our daily practice if its significance is to be maintained. The pressures of modern medical practice, as encountered in the field of radiology, continuously infringe on the time available for expression of personal interest in our patients.

... The zeal of our forebears in protection of the public against the charlatanism of mere picture making will have come to naught if the warmth of medical care is lost to our specialty.

Continuation Study

Treatment of the Nephrotic Syndrome with Malaria

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THE term nephrotic syndrome refers to a clinical picture characterized by edema, albuminuria, hypoproteinemia and hypercholesterolemia. Diagnosis of the nephrotic state, however, does not necessarily imply recognition of its etiology in any given patient. In the patients who received malaria therapy, attempts were made to

temia, recent infection, or electrolyte abnormalities. When administered to suitable candidates in doses of 100 to 200 units per square meter of surface area per day for ten to fourteen days, corticotrophin produces remissions in 60 to 80 per cent of the patients treated; however, remissions lasting twelve months or longer are seen in only 20

TABLE I. REFERENCES TO MALARIA THERAPY IN THE NEPHROTIC SYNDROME

Author	No Azotemia			Azotemia		
	No. Cases	Remissions		No. Cases	Remissions	
		Complete	Partial		Complete	Partial
Gairdner ¹³	3	2	0	1	0	0
Byrne ¹⁴	1	1				
Shaper ¹⁵	6	3	0	1	0	0
Gairdner & Shute ¹⁹ (Collected Series)	41	8	11	12	0	5
Durand & DeToni ¹⁶	2	2				
Mochtar ¹⁷				4	0	0
Gilbertsen & Bashour ¹⁸	4	3	1	1	0	0
TOTALS	57	19	12	19	0	5

TOTAL CASES—76

rule out certain specific causes of the nephrotic syndrome including syphilis, diabetes, amyloidosis, disseminated lupus erythematosus, thrombosis of the inferior vena cava or renal vein, and the toxic nephroses. Lipoid nephrosis and chronic glomerulonephritis have been the primary diagnoses in the patients of the present series. Since these latter two diseases are difficult to differentiate, the less specific term *nephrotic syndrome* is preferred.

Therapy of the nephrotic syndrome is no less difficult than precise diagnosis. Steroid therapy is the generally accepted treatment of choice in patients who do not manifest hypertension, azo-

to 43 per cent.¹⁻⁸ It is apparent that many patients respond only transiently to steroid therapy, demonstrate contraindications (especially hypertension) to the use of steroids, or become refractory to steroids as well as other forms of treatment. It is with these patients in mind that the use of malaria therapy in the nephrotic syndrome has been explored.

Febrile illnesses such as measles^{9,10} or hepatitis¹¹ occasionally have been observed to have dramatic effects on the course of the nephrotic state. Fever therapy has been attempted using induced measles; lack of control measures and the danger of encephalitis have prevented widespread use of this method. Typhoid vaccine has not been effective.¹² The ease of control and the rarity of complications with *Plasmodium vivax* make the use of malaria a reasonable approach to the therapy of the nephrotic syndrome.

Read before the Continuation Course in Recent Advances in Internal Medicine, University of Minnesota, Minneapolis, February 13, 1956.
The malarial blood used in this study was furnished by the Laboratory of Tropical Diseases, United States Public Health Service, Columbia, South Carolina.
Dr. Gilbertsen is an Instructor in Medicine, Department of Medicine, University of Minnesota Hospitals.

TABLE II. CHANGES OBSERVED WITH MALARIA THERAPY IN THE NEPHROTIC SYNDROME

During or Immediately Following Malaria	Late Changes
1. Water diuresis	1. Gradual restoration of serum albumin
2. Sodium diuresis	2. Gradual disappearance of urine albumin
3. Decline in blood pressure	3. Gradual decline of ESR
4. Rapid decline in serum cholesterol	
5. Transient fall of hemoglobin	
6. Transient rise of BUN	
7. Decrease, but not disappearance, of urine albumin	
8. Little or no change in serum albumin	

A summary of the literature on malaria therapy in the nephrotic syndrome appears in Table I. The first reports by Gairdner¹³ and by Byrne¹⁴ in England appeared in 1952. Subsequently, several other reports have appeared.¹⁵⁻¹⁸ Recently Gairdner and Shute¹⁹ reported fifty-three additional patients treated in England whose cases previously had not been reported, making a grand total of seventy-six cases reported to date.

These patients are most conveniently grouped according to the presence or absence of azotemia and according to whether complete or partial remission occurred. Partial remission indicates either incomplete loss of edema or a remission persisting three months or less. Of the nineteen patients with azotemia, none obtained a complete remission; only five were reported to show favorable response. Approximately one-half of the patients without azotemia manifested a favorable response to malaria.

Inoculation and Management of Malaria

Malaria therapy has been attempted in ten patients with the nephrotic syndrome at the University of Minnesota Hospitals and Ancker Hospital. Clinical malaria was produced in nine. Six of these patients have been reported in detail elsewhere.¹⁸ Vivax malaria was used exclusively because this form is not associated with cerebral malaria or blackwater fever, and it may be readily terminated.

Intravenous inoculation of blood containing viable parasites was used in preference to mosquito inoculation because of the lower relapse rate associated with the former.

Using chloroquin as the only antimalarial agent, relapses with intravenous inoculation are 0.2 per cent as compared to 20 per cent with mosquito inoculation.²⁰ The incubation periods varied from twenty-four hours to nine days. Two patients were

inoculated twice to produce clinical malaria; one patient did not develop clinical disease although inoculated three times. Chloroquin was used to terminate fever in all patients.

The patients were allowed to experience between one and thirteen pyrexial episodes. The indications for terminating malaria were the onset of diuresis in two patients, prostration in two, hypotension in two, and clinical deterioration in two. In one patient fever was arbitrarily stopped after thirteen febrile periods. The fever was usually quotidian at first and then became tertian.

Clinical Material

All nine patients in whom malaria was induced had been treated previously with conservative measures including bed rest and salt restriction. Five had also received steroid therapy, and three patients had been treated with nitrogen mustard. The duration of symptoms prior to therapy was from one to twenty-two months. The age range was seven to sixty-seven years.

Hypertension was a feature in five patients. Azotemia or electrolyte abnormalities or both were present in three patients. Of the six patients who did not have azotemia or electrolyte disturbances, excellent remissions were obtained in five following malaria therapy.

Results

In the patients in whom remissions were obtained with malaria therapy, certain changes occurred with regularity. These changes are summarized in Table II. The sodium and water diuresis often occurred immediately following termination of malaria, but in two patients began during malaria therapy. A decline in blood pressure, seen in all patients, was especially striking in those who had hypertension initially. A precipitous fall in serum cholesterol was seen in all patients during therapy whether or not a remission occurred. A transient fall in the hemoglobin and a rise in blood urea nitrogen (BUN) during therapy was the rule; return to normal hemoglobin level occurred within a month. Albuminuria regularly decreased but did not disappear at the time of malaria therapy. Little or no change in the serum albumin levels was seen during treatment.

Restoration of the serum albumin to normal, disappearance of albuminuria, and decline to normal of the erythrocyte sedimentation rate occurred

TABLE III. MALARIA THERAPY IN PATIENTS WITHOUT AZOTEMIA OR ELECTROLYTE ABNORMALITIES

Pt. Age Sex	Length of Symptoms	Previous Therapy	Immediate Results	Late Results	Present Status
I.R. 19 yrs. Female	6 mo.	Bed rest Diet Cortisone Plasma expanders	Diuresis 44 lb. wt. loss B.P. 132/100—118/78 Chol. 573—199	Urine alb. 0 at 2 mo. Serum alb. 3.6 at 1 mo. ESR 40 at 16 mo.	Relapse at 20 mo. Response to bed rest and diet
M.H. 20 yrs. Female	2 mo.	Bed rest Diet Diuretics	Diuresis 25 lb. wt. loss B.P. 112/70—95/60 Chol. 602—292	Urine alb. 0 at 6 mo. Serum alb. 3.3 at 2 mo. ESR 11 at 9 mo.	Well at 17 mo. B.P. 110/70 Urine alb. 0 Serum alb. 4.1 Cholesterol 177
I.McL. 60 yrs. Female	8 mo.	Bed rest Diet Cortisone Nitrogen Mustard Mechanical drainage Transfusions	Diuresis 60 lb. wt. loss B.P. 210/110—115/80 Chol. 323-247	Urine alb. tr. at 8 mo. Serum alb. 3.2 at 8 mo.	Well at 12 mo. B.P. 160/90 Urine alb. trace Serum alb. 3.0
R.S. 7 yrs. Male	22 mo.	Bed rest Diet Cortisone Nitrogen Mustard	Diuresis 27 lb. wt. loss B.P. 150/120—120/80 Chol. 609-262	Urine alb. 1+ at 1 mo. Serum alb. 1.9 at 1 mo.	Relapse at 3½ mo. No hypertension Good response to measles, ACTH & cortisone
L.E. 21 yrs. Female	5 mo.	Bed rest Diet	Diuresis 26 lb. wt. loss B.P. 120/85—110/60 Chol. 316-161		Well at 8 mo. B.P. 110/80 Urine alb. trace Serum alb. 3.0 ESR 41 Cholesterol 175
L.H. 67 yrs. Female	20 mo.	Bed rest Diet Hydrocortisone Diuretics	?Diuresis 15 lb. wt. loss B.P. 120/85—80/50 Chol. 316-186		No change at 2 mo. Urine alb. 2+ Serum alb. 2.7 Cholesterol 348

gradually over a period of several months. The changes in blood pressure, serum cholesterol, albuminuria, serum albumin, and erythrocyte sedimentation rate following malaria therapy are in contrast to the behavior of these indices following steroid therapy.

Table III illustrates the immediate and the later changes produced by malaria therapy in the six patients without previously existing azotemia or electrolyte abnormalities. Three of these patients initially had significant hypertension. Four had received steroid therapy previously, and two had been treated with nitrogen mustard. An excellent response was obtained with malaria in five of the six patients. The weight loss in each patient was commensurate with the magnitude of the diuresis; this amounted to 60 pounds in one patient. Patient L. H. did not have a favorable response. She had minimal edema prior to therapy, and the serum albumin was not remarkably low (2.4 gms. per cent); with malaria she lost 15 pounds in weight and lost the edema, but no striking diuresis and little change in the albuminuria or the serum albumin occurred.

The change in blood pressure is shown for each patient. All patients who were hypertensive initially became normotensive during malaria therapy. In one patient, normotensive prior to therapy,

the fall in blood pressure was such that support of the circulation with vasopressor substances was necessary for several days.

The magnitude of the cholesterol decline during therapy is shown for each patient. Although the disappearance of albuminuria occasionally occurred as early as two months after therapy, albuminuria usually decreased slowly over a period of several months. The restoration of normal serum albumin levels occurred as early as one month after therapy, but the serum albumin usually increased slowly over a period of several months. The sedimentation rate did not return to normal in any patient before nine months.

Three of these six patients have enjoyed sustained remissions for seventeen, twelve, and eight months, respectively. All three are free of edema and have normal blood pressures. One patient has no albuminuria; the other two show a trace. The serum cholesterol is normal and the serum albumin is 3 gms. per cent or greater in each.

Of two patients who relapsed, the first had a sustained remission for twenty months and was seemingly entirely well during that time. With relapse of the nephrotic state, the previously existing hypertension did not recur. She has recently obtained a good response to bed rest and

TABLE IV. MALARIA THERAPY IN PATIENTS WITH AZOTEMIA OR ELECTROLYTE ABNORMALITIES

Pt. Age Sex	Length of Symptoms	B.P. mm.Hg.	BUN mg. %	CO ₂ Comb. meq./L.	Previous Therapy	Previous Complications	Complications with Therapy	Autopsy Diagnosis
C.C. 6 yrs. Male	19 mo.	170 130	58		Cortisone ACTH Nitrogen Mustard Albumin	Peritonitis (with ACTH)	No diuresis B.P. fell to 150 120 BUN 55 Expired after discharge from hospital	Subacute Glomerulonephritis
A.S. 13 yrs. Male	1 mo.	240 130	47	15 (Acidosis)	Bed rest Diet Diuretics	10 yrs. Hypertension Old CVA	Rapid increase in BUN Clinical deterioration Expired 1 week after malaria was discontinued	Arteriolar Nephrosclerosis
R.J.† 13 yrs. Male	5 mo.	120 80	18	15-19 (Acidosis)	Bed rest Diet	Perforated ulcer	Clinical deterioration with shock and ventricular tachycardia Expired following a single episode of fever	Subacute Glomerulonephritis

†Patient R. J. was studied through the courtesy of Dr. William Mazzitello, Chief, Department of Medicine, Ancker Hospital, St. Paul, Minnesota.

alt restriction, measures which were not effective two years ago. The second relapse occurred in a even-year-old boy who was ill almost two years prior to malaria therapy. Although he obtained good clinical remission, including relief of hypertension, the serum albumin did not rise above 1.9 gms. per cent. Relapse occurred three and one half months after therapy, but hypertension did not recur. He has subsequently responded well to ACTH, measles, and cortisone.

The glomerular filtration rate, as measured by the clearance of insulin and the renal blood flow, is measured by para-amino hippurate clearance, were ascertained before therapy and again after the cessation of diuresis in two of the patients who obtained good responses to malaria. Each patient manifested improvement in both renal functions from low values prior to therapy to near normal values after diuresis.

The dramatic responses observed in the patients who had no azotemia or electrolyte disturbance are in contrast with the responses in the three patients with azotemia or electrolyte deviations or with both. The cases of these three patients are summarized in Table IV. Malaria therapy was well tolerated by patient C. C., although the BUN was 58 mg. per cent. However, no favorable response was observed. Subsequently he remained refractory to nitrogen mustard and eventually died of uremia. The other two patients had rapidly progressing clinical courses; unfortunately, steroid therapy was contraindicated in one patient by the presence of severe hypertension and by the history of a perforated peptic ulcer in the other. Each of these latter patients manifested

a low carbon dioxide (CO₂) combining power remarkably disproportionate to the BUN. Malaria was tolerated poorly by both patients; it is possible that malaria hastened the demise of both. In view of this experience, azotemia and electrolyte abnormalities, particularly a low CO₂ combining power, are believed to represent absolute contraindications to malaria therapy.

Mechanism of Action of Malaria

The mechanism of action of malaria fever in inducing remission of the nephrotic state remains obscure. Fairley and Bromfield,²¹ in 1933, observed that patients with malaria regularly exhibit a marked decline in serum cholesterol associated with decreased hemoglobin and increased blood urea levels. Gairdner¹³ postulated that the lowered serum cholesterol initiates the response in some unknown way. Byrne¹⁴ considered that malaria works by way of adrenal stimulation. This latter hypothesis receives some support from the observations of McCall and Singer²² who found increased urinary corticoid excretion in one nephrotic child with fever associated with peritonitis.

The possibility also exists that malaria therapy acts primarily through a change in the immune mechanisms of the nephrotic patient. Gairdner and Shute¹⁹ followed the electrophoretic patterns of serum proteins in several patients and found an increase in gamma globulin levels about 10 days after the onset of malaria. The alpha globulin returned to normal only after several months. Additional observations and studies will be necessary before these problems are clarified.

Summary

Malaria therapy was attempted in ten patients with the nephrotic syndrome; clinical malaria was produced in nine patients. Of the six who did not have azotemia or electrolyte deviation, five sustained excellent remissions. The remissions occurred despite the presence of hypertension or refractoriness to other forms of therapy. When hypertension was present, relief followed a course of malaria. When relapses occurred, the patients then responded to forms of treatment which previously had been ineffective.

Three patients are in remission eight months, twelve months, and seventeen months after malaria therapy. Relapses have occurred in two patients, twenty months and three and one half months after treatment.

In the three patients with pre-existing azotemia or electrolyte abnormalities or both, malaria was not of benefit and possibly hastened the demise of two. Azotemia and substantial electrolyte deviations, especially low CO_2 combining power, thus, probably represent absolute contraindications to malaria therapy.

Addendum

The patient, L. H., shown in Table III as the only patient without azotemia or electrolyte abnormalities who did not respond favorably to malaria therapy, has recently been shown by biopsy to have primary amyloidosis. Thus the patient has improperly been included in this series of cases of lipoid nephrosis and chronic glomerulonephritis.

Remissions in patient M. H., I. McL., and L. E. have been sustained for twenty-two months, seventeen months, and thirteen months, respectively.

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Tumor Conference

Section Editor

CLAUDE HITCHCOCK, M.D.

CASE STUDIES, ST. BARNABAS HOSPITAL

Case 1.—This fifty-six-year-old white man was presented to the Tumor Conference with a lesion on the shaft of the penis about $1\frac{1}{2}$ cm. in diameter. The lesion included a portion of the corona and extended back on the shaft of the penis and was well circumscribed with a central ulceration that contained purulent material. The initial impression of this lesion from superficial examination was that of a chancroid.

The patient first noted the appearance of the ulcer about six months previously and denied sexual intercourse during the past month, as well as any outside sexual activity. Examination of the patient revealed the Wassermann to be negative, and a biopsy of the lesion was reported as a squamous cell carcinoma.

After discussion regarding the type of therapy to be applied, the tumor board recommended an exploration of both inguinal regions for lymph nodes, and if none were found the primary lesion on the shaft of the penis was to be treated with irradiation therapy. Treatment with radium was also recommended.

Discussion: Carcinoma of the penis varies greatly in incidence from one country to another. The incidence in the United States is very low, but the incidence in such countries as China, Siam, Java, and Europe is relatively high. In some European countries as many as 5 per cent of all carcinomas in the male are represented by carcinomas of the penis. Although many suggestions have been made regarding the relationship of carcinoma of the penis to circumcision, it is still not definitely established that ethnic factors are of equal importance to factors of simple cleanliness.

The extension of these lesions is upward on the shaft of the penis to the suprapubic lymph glands and then laterally to superficial and deep nodes in the region of the inguinal ligament. Adequate treatment for carcinoma of the penis requires bilateral and thorough inguinal-iliac lymph node dissections. The primary cancer can be treated in one of several ways. Application of superficial roentgen therapy has given good results, but it is emphasized that the therapy must be well fractionated and the treatments applied in a careful manner. The superficial surface application of radium by means of radium molds has been used for this type of carcinoma, but great skill is required to assure good results. The standard method of treatment for carcinoma of the penis is amputation of the organ allowing at least $1\frac{1}{2}$ cm. of clear tissue proximal to the lesion; surgical excision has been found of much value in completely eradicating the primary tumor. The safest and surest method of controlling metastases would be the performance of a bilateral inguinal-iliac lymph node dissection even in the absence of palpable nodes.

Case 2.—A fifty-four-year-old married woman came to the Tumor Conference complaining of pain in the right forearm that had its onset during October, 1956. She described this pain as aching and occasionally pounding

in character, with a feeling of tightness in the right forearm. The pain was of an intermittent quality but frequently was excruciating and disabling. Physical examination revealed the right arm to be considerably swollen in the upper two-thirds. The skin was rather hard but there was no color change and no local heat. The entire right arm was edematous below the region of the tumor and there was some limitation of motion at the wrist, elbow and finger joints.

Roentgenograms of the right shoulder and humerus revealed an extensive osteolytic process involving the proximal half of the shaft of the right humerus and extending into the head of the humerus. The cortex was broken through in several areas and some areas of sclerosis were noted but there was no true bone production identified. Associated with the bony changes was a large soft tissue mass which extended particularly up into the region of the axilla. A biopsy of the lesion was performed and the diagnosis of a reticulum cell sarcoma was made. The patient was then operated upon with a formal scapulo-humeral disarticulation of the right upper extremity. During surgery there was no reason to believe the lesion had spread beyond the site of the upper end of the humerus, and the lines of resection were clean and free of any tumor. The patient did well postoperatively and left the hospital on her eighth postoperative day.

Approximately two months following surgery, however, the patient developed a mass in the upper anterior chest wall on the right side. This mass was biopsied with the resultant diagnosis of a recurrent reticulum cell sarcoma in the stump of the pectoralis major muscle. The patient was started immediately on roentgen therapy and was doing well as of April 18, 1957, following a total of 2700 roentgens already received.

Discussion.—The therapy of choice for reticulum cell sarcomas of the bone, particularly when localized to one bone at the time of initial therapy, is surgical removal. However, it must be realized that these tumors do invade from the bone outward into surrounding tissues, and can extend for relatively great distances in the fascial planes and along the blood vessels and lymphatics as they course away from the area of involvement. Undoubtedly, in this case, the residual tumor found several months after the primary disarticulation was due to small emboli of tumor present in the pectoralis major muscle by direct extension from the primary mass.

Roentgen therapy is an important adjunct in the therapy of these tumors. This type of cancer is highly radiosensitive, and, particularly in the case of metastases, prolonged and significant palliation can be effected. Even in the presence of a distant metastasis with a primary as presented here, surgery of the type performed would probably be the initial therapy of choice. It is beneficial to remove from the patient the large mass of tissue that would probably respond somewhat more poorly to roentgen therapy than smaller more circumscribed lesions. The combined approach of surgery and roentgen therapy in this patient would seem to be highly desirable.

Editorials

JOHN F. BRIGGS, M.D.
ARTHUR H. WELLS, M.D.
HENRY G. MOEHRING, M.D.

LEO G. RIGLER

On June 30, 1957 Dr. Leo G. Rigler left the University and the state of Minnesota to accept the post of senior consultant in charge of graduate medical education in radiology at the Cedars of Lebanon Hospital in Los Angeles. He will also be a visiting Professor at the University of California, Los Angeles.

Leo Rigler's superb contribution to medicine and medical education over the past thirty years is self-evident to a degree that it scarcely requires comment, yet there are a few points that may deserve special emphasis. One of his great faculties has been that of integrating radiology with medicine, making it understandable to the physician and ever of greater value in practice. Rather than promoting the segregation of radiology on a far mountain top of mathematics and physics, he has steadily succeeded in showing how well it complements information which may be gained about the patient by other methods. His attitude toward radiology in medicine has consistently been wise and tolerant, recognizing its tremendous potential when properly employed and its limitations when used too narrowly.

It seems quite likely that Leo Rigler's broad wisdom in medicine is based not alone on his inherent qualities of mind but partly on his early experience. Many are unaware that after graduation from the University of Minnesota Medical School in 1919 followed by an internship at the St. Louis City Hospital, he spent a very active period as a family physician in a small community in western North Dakota. He often speaks of this background with genuine appreciation of its later effect on his teaching of medical students and his whole contact with the medical profession. It is also noteworthy and often unrecognized in respect to its impact on the unfolding of his subsequent career, that he next devoted himself to internal medicine, returning to the Minneapolis General Hospital as a resident under Dr. Henry Ulrich. It was during this period that he saw the tremendous significance of radiology, still a young science, for medical diagnosis, and that his interest became fixed in a career in this specialty.

It may be worthwhile to contemplate a further the factors responsible for his very great stature as a teacher and scientist. Quite apart from his personal warmth, enthusiasm, and lightful sense of humor, he has demonstrated remarkable ability in bringing scientific radiology to medical students and physicians. This is in part due to his simple and logical method of presenting his information and ideas—also to his success in integrating radiology with the basic sciences on the one hand and with clinical phenomena on the other. His use of topographic anatomy and the excellent manner in which he illustrates it for students, his understanding of pathological changes in relation to radiological findings, and his ability to correlate both with clinical signs—these are some of the reasons why he has won such a justly deserved worldwide reputation as a great teacher.

We respect but we must all keenly regret his decision to leave the University, at the same time saluting his fine achievements and wishing him the utmost success and happiness in his new endeavor.

C. J. WATSON, M.D.

THE UNIVERSITY—THE MEDICAL SCHOOL—SCHOLARSHIP

The academic year is drawing to an end, and this University presents another group of young men and women qualifying as Doctors of Medicine. These individuals have been the participants in a magnificent social privilege. As a reward for ability they were selected from a large list of candidates to enter a great university for the purpose of preparing for a medical career. Medicine has long occupied an honored position in the university. The first and oldest university in Europe, the University of Salerno, started a medical school around the year 1000 A.D. Our own country from its earliest days has always respected the place of the university in its culture with the clergyman and the physician occupying

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tions of dignity and honor in the community. The purposes of a university in the mid-twentieth century are complex. Fundamentally, according to Whitehead, "the proper function of university is the imaginative acquisition of knowledge." The faculty should "wear their learning with imagination." The student should probe the past, and acquire a contemporary concept of medical science with enthusiasm and in a spirit of excitement. His teachers must not only master knowledge of the present but should push beyond the horizon creating new knowledge, thus contributing to the general welfare and happiness of man.

The Medical School at the University of Minnesota in a relatively short period of time has assumed a position with the best in the United States. The faculty has been possessed with imagination and enthusiasm. A documentation of their creative achievements would be boastful. But a fair and sympathetic administration has recognized their accomplishments. Standing in the midst of the University are modern laboratories and engaged hospital facilities. But the heart of a university, or of any professional school, is the faculty-student relationship. Without this bond, buildings are just so much dust.

The prospective students of medicine have always been carefully selected, and rightfully so, since the physician's responsibility to his fellow man is direct and exacting. The selection has been based primarily upon ability and character. A student who selects a career of medicine must be dedicated. The training demands the utmost in self-discipline, and the course is long and expensive. Unfortunately, many qualified young persons cannot select medicine because of the financial barrier. And equally unfortunate is the student who cannot give of his best when in Medical School because he must weary himself with outside employment.

Members of the faculty, graduates of the Medical School, and many friends have long recognized the need for scholarships to aid the capable student who would otherwise not enter medicine, or to help those individuals in school who were seriously handicapped by financial needs. This need for scholarships was one of the basic reasons for organizing the Minnesota Medical Foundation. Through the efforts of Dr. Donald Cowling, Dr. Owen Wangenstein, Dr. Karl Anderson, and many others, a modest but meritorious scholarship

program has been started. Generous contributions have come from physicians, industry, medical organizations, and grateful lay people. The philosophy of the Foundation in awarding the scholarships has been two-fold. First, awards have gone to individuals who have demonstrated scholastic ability, and who at the same time have presented evidence of financial need. Second, scholarships have been awarded to those students whose financial needs have been so severe that they have not had a fair chance to demonstrate their intellectual abilities. The pursuit of scholarship demands a certain modicum of leisure. The frustrated, fatigued and worried student, devoid of adequate financial resources, simply cannot do good work. In many instances, financial help to such persons has been most gratifying, and has resulted in notable improvements in the student's class standing. The Foundation has not embarked upon a program of loans to needy students. The management of such a program would require a larger fund and an increase in staff. Furthermore, the University does have a loan fund available to students of medicine.

The University of Minnesota and the Medical School are proud of their heritage. The present faculty and the students will continue to uphold the high standards of scholarship. It is the continuing hope that no worthy student shall be denied the privilege of studying medicine because of financial want, or that any student shall fall by the wayside because of finances. The Foundation will not only continue the scholarship program, but will do so on a broader scale. An endowment fund that will perpetuate the program is urgently needed, and should occupy the attention of all the members and of their friends.

WESLEY W. SPINK, *President,*
Minnesota Medical Foundation

CALENDAR HISTORY

The big switch, in 1752, of England and America from the Julian to the Gregorian calendar and the resultant loss of eleven days is duly chronicled by Benjamin Franklin.

Franklin, generally credited with introducing the calendar as we know it today in America, in his thorough and painstaking way did not let this change pass unnoticed. He devoted most of his 1752 edition of *Poor Richard's Almanac* to the

Fourth in a series of editorials on calendar history.

calendar. He traced its origin and development, the various ways of computing time and the reason for the sudden alteration in dates. His readers were well aware there was more to making a calendar than merely printing names and numbers on paper.

Current periodicals of the time shed some light on the conflicts caused by the institution of a new calendar and the jump from September 2 to September 14.

An indignant writer to *Gentlemen's Magazine* (London, Sept., 1752) lets go with some sharp criticism of the shift.

A Mr. R. R. asks the publication "to settle my affairs or I shall run mad or break my heart."

R., who went to bed on Wednesday, September 2, and woke up Thursday, September 14, writes:

"Have I slept away eleven days in seven hours? I don't find I'm any more refreshed than with a common night's sleep."

He protests the loss of his own birthday since he was born on September 13, as well as the birth-dates of saints of the Church and other notables celebrated in this period.

Getting to the real point of his letter, Mr. R. recounts in a less humorous manner:

"I have solicited the most amiable of her sex for five weeks. She seemed to laugh at me, although my fortune is equal to her own, but at last she fixed the day, September 10 and [apparently to clinch the deal] gave me a bond of 10,000 pounds for the performance.

"I have consulted my lawyer . . . and he says the date 1752 is fixed to the document and it won't do for next year . . . so my 10,000 pounds is not worth 10 pence.

"A fine affair . . . a man must be cheated out of his wife by a parcel of mathematicians and almanac makers before he has her . . . a new form of divorce, even if parliament did do it."

So writes the choleric Mr. R.

Others in the *London Magazine* write in similar style, protesting confusion of records, the ruin of rental and leasing arrangements and utter consternation in their attempts to run a normal business in a month with the center chopped right out.

Mr. Roger Plowland writes to this publication about his problem. Concerned over the loss of eleven days, Mr. Plowland finds it is "greatly puzzling all the folks in our neighborhood and

I learn, when I go to the market, that others in as great a bother about them as ourselves."

He claims all the "almanac maker" tells is that the calendar jumps from September 2 to September 14. "This is all the account given us of the eleven days we are hunting for, but of which we in the present have lost the scent. Eleven days have been annihilated," he reasons.

Leases, rents and all business is fouled up, Plowland goes on. He doesn't care what lawyers, astrologers and conjurers have to say, "even the parson of our parish may say to the contrary," but he feels that provision should have been made so that "the business of October may have gone on immediately without interruption."

In addition to these literary objections, there were also more pronounced demonstrations. Disappointed tenants, shareholders and tradesmen who felt cheated out of money or goods through the sudden calendar manipulation, made known their state of mind more violently.

Street fights and riots arose over the switch, and unchronicled perhaps are countless brawls in inns and wine shops between proponents and adversaries of change.

But life and the calendar survived.

JOSEPH H. SUMMITT
Brown and Bigelow

CONFESSIONS OF A HOBBYIST

Cabinet-Making

I was forty-five years old when I started serious cabinet-making. Until then, I had done occasional rough carpentry—the kind of thing one does with old packing-boxes, but precision work was new to me. I began acquiring wood-working machinery—first a circular saw and jointer, then, gradually a lathe, drill-press, sander, band-saw, and, last of all, a spindle shaper. It was some time before my shop was complete; a schoolmaster has to save up for things like that, and the machines came one at a time. Also, I inherited some fine hand tools. The use of these things was learned the hard way, from books and from bitter experience. Some good wood got ruined, and occasionally I had a minor accident, usually from an infuriated screwdriver or some such innocuous weapon, because I was too scared of the machines to get anywhere near the blades. One of the first things

Fourth in a series of editorial's on hobbies.

to be learned is that working with tools is labor, sweat, and blisters unless they are sharp, and that it takes both skill and patience to get the right edge on a plane or chisel, or to file a saw.

Of course, I had to start with something too hard. It was a maple butterfly table, from plans I had seen in a magazine. That was an education in itself. The turned legs were pretty awful, but the mortised and pinned joints came out rather well. I learned to my sorrow that maple is very hard wood, indeed! But, gradually, I did progress so that I could do passable turning, make honest, if not perfect, mortised joints, and manipulate hot cabinet-maker's glue; our old commercial furniture was gradually replaced by mahogany and maple pieces. These might not bear minute inspection, but they are well enough made to outlast me and my children.

The hard part is finding good designs. Unfortunately, I seem to be an artisan more than an artist, and while I can recognize and appreciate good proportions, I can't seem to create them. My neighbor and friend, the late Lindley Hosford, was a life-saver. If I wanted to make a sideboard or a chest of drawers, he would make a sketch, beautifully proportioned, and then I'd take over. Some of the pieces were maple, and if there is any meaner wood to work with than birdseye maple, I have yet to find it. Others were mahogany, and some millwork was pine. There are unexpected advantages in having a woodworking shop in the house. A small boy neighbor amused himself by kicking out some of the turned spindles in my porch rail, and I had merely to go upstairs and turn out a few spares for replacement.

People always seem to be interested in the cost of this hobby. I kept careful account of every cent spent for machinery, tools, hardware, lumber and glue. At the end of five years, I put conservative valuations on the pieces of furniture I had made, and to my pleased surprise, the two totals almost balanced and—I had the shop for my labor. I still have it, though I am not making large pieces any more. I manufacture a few picture frames, or turn a few bowls. One's interest in woodworking doesn't die.

JOHN de Q. BRIGGS

THE PRESERVATION OF BOOKPLATES

The first article in this series told of the 500 years of bookplate history; the second told of collecting and exhibiting. Prized collections are preserved in various libraries of cities and colleges. In 1938, a booklet of ninety pages, entitled "A Census of Bookplate Collections in Public, College and University Libraries in the United States," was prepared by Clara Therese Evans and Carlyle S. Baer and published in Washington, D. C.

In the foreword to this list, Louis J. Bailey, Chief Librarian of the Queen's Borough Public Library, New York City, wrote:

"Good collections should be given only to institutions that can adequately care for them. . . . Bookplate collections are no exception. One of the great values of this Census is that it will afford knowledge of what collections have been assembled and preserved, where they are, the type of material gathered, how they are cared for and their availability for study and consultation. Perhaps it will also call to attention the emphasis necessary on classification of bookplates, methods of preservation and use, and forms of indexing or cataloguing to make ready consultation possible. These should not be unconsidered trifles, if any collection is to serve a good purpose and be worthy of proper care and extension. Libraries seem the natural depository for bookplates which are a part of book lore; but, at that, considerable care in choosing must be taken so that only those libraries will be selected where care, study and exhibition are adequately provided. Something more than mere storage is necessary. . . . Libraries are now providing exhibit space for their rare and interesting possessions as never before."

The most famous collection of bookplates is that of the late Sir Augustus Franks of London, which numbers thousands. It is housed in the British Museum. The most important printed catalog of bookplates is the British Museum "Catalogue of the Franks Collection" in three volumes, 1903-04. The largest collection of bookplates in any English public library is in Liverpool: "over 60,000 specimens of the work of the finest engravers and etchers of all periods." The Catalogue of the Liverpool Collection has main entries arranged under the names of the owners of the plates, and index entries for styles, engravers and designers.

In America, the most notable depository is

(Continued on Page 599)

Third in a series of editorials on bookplates.

President's Letter

THE FIFTY CLUB

Some far-seeing members of the medical profession of the State of Minnesota conceived an idea fifteen years ago of honoring, at the annual banquet of the Association, those physicians of the state who have practiced medicine for fifty years. Physicians who had practiced medicine for fifty years were accorded the privilege of becoming members of the Fifty Club. A group of forty-one physicians was the first so honored, in 1942. Since that year the annual ceremonies attendant upon admitting new members to the Fifty Club have taken place at the banquet of the Association. The ceremonies represent an expression of appreciation by the Association for fifty years of faithful and dedicated service to the sick, as well as to the medical profession, by physicians of this state. To date, certificates of membership in the Fifty Club have been issued to 319 men and women since the group was started. In addition to the original forty-one members, there were seven in 1943; nine in 1944; twelve in 1945; ten in 1946; twenty-four in 1947; eleven in 1948; fourteen in 1949; thirty-three in 1950; twenty in 1951; twenty-three in 1952; eighteen in 1953; twenty-two in 1954; eight in 1955; and twenty-four in 1956. In 1957 there were forty-three.

It is interesting to note that the number of physicians in the 1957 group was the largest to date, even larger than the number in the original 1942 group, which embraced a larger field. Of the forty-three honored in 1957, thirty-one were present at the banquet. Each received an honorary certificate and a lapel button. Among these was Dr. W. W. Will, a former president and long-time councilor of the Minnesota State Medical Association, who on that day celebrated not only his fifty years in practice, but his wedding anniversary and his birthday as well.

To those physicians eligible for the ceremonies of the Fifty Club but who are not able to attend them, the button and certificate are sent immediately after the meeting, except in those instances where the home community arranges a way of honoring these physicians. Thus, local ceremonies of honor were held in the case of Dr. O. W. Scholpp in Hutchinson, which is in Dr. C. G. Sheppard's district. The speaker of the House of Delegates is honored each year by the privilege of presenting the certificates and the lapel buttons.

For those concerned with the matter of early retirement, it is interesting to note that many of the physicians who received the coveted fifty-year award are still in the active practice of medicine, five and ten years later.

Among the women physicians in the group who practiced or who have practiced fifty years or longer are Orianna McDaniel of Minneapolis, 1944; Jeanette McLaren of Minneapolis, 1945 (deceased 1953); Anna Hurd of Minneapolis, 1950; Nellie Barsness of St. Paul, 1952; Stella Wilkinson of St. Paul, 1953 (deceased 1955); Hilda Luck of Mankato; Elizabeth Monahan of Minneapolis; and Margaret Smith, formerly of Minneapolis. Drs. Luck, Monahan and Smith became members of the Fifty Club in 1957.

Probably it would be difficult, and more than likely it would mean the listing of the names of all the physicians so honored, to write here about all who are well known in organized medicine. However, it is interesting to note that in the original group honored in 1942 was Dr. H. B. Sweetser, Sr., of Minneapolis, the father of the present president-elect of our Association, and Dr. P. E. Sheppard, of Hutchinson, the father of the present councilor of the Fourth District. Members of the

PRESIDENT'S LETTER

1943 group included Dr. George Haggard, of Minneapolis, who recently observed his 100th birthday and still keeps in touch with organized medicine and developments in medical research. The group also has included many officers of the Minnesota State Medical Association, among them Dr. W. H. Condit, who died last year and was treasurer of the Association for many years, and the late Dr. W. A. Coventry, of Duluth, a past president and long-time delegate to the American Medical Association. Both of these men became members of the Fifty Club in 1950. Dr. B. S. Adams, of Hibbing, a former president, joined the Club in 1951. Dr. W. F. Braasch, of Rochester, a former trustee of the American Medical Association, joined the Club in 1953. Dr. Robert M. Burns, of St. Paul, chairman of the Association's Radio and Television Committee for many years, joined the group in 1956. The same year, the late Dr. Ludwig L. Sogge, of Windom, who was so well known for his many years as chairman of the Public Policy Committee, became a member. Dr. E. A. Meyerding, former secretary of the Association, became a member in 1952. Dr. H. Z. Giffin, of Rochester, a former president, became a member in 1954. In addition, the following physicians, all former presidents, became members of the Fifty Club in the following years: Dr. J. T. Christison, St. Paul, 1942; Dr. William Davis, St. Paul, 1942; Dr. S. H. Boyer, Duluth, 1942; Dr. J. Frank Corbett, Minneapolis, 1947; Dr. S. H. Baxter, Minneapolis, 1952; Dr. G. D. Head, Minneapolis, 1947; Dr. E. M. Hammes, St. Paul, 1957; Dr. E. Mendelssohn Jones, St. Paul, 1957; Dr. F. J. Savage, St. Paul, 1951; W. L. Burnap, Fergus Falls, 1951; and Dr. E. L. Tuohy, formerly of Duluth, 1956.

It is obvious, from the letters received at the headquarters office, that physicians generally consider it a high honor to be included in this Fifty Club. This is well attested to by the letters received from those who are unable to attend. One telegram at the 1957 banquet, from one not able to attend, saluted the "gallant crew that has survived more than fifty years in the practice of medicine." Another of these physicians managed to attend the ceremonies on May 14 after much uncertainty, because she had been ministering to a patient who had been very ill for several days, and she did not know until shortly before the banquet that she would be able to leave him.

It is also of particular note that Dr. Justus Ohage, Sr., of St. Paul, was president of the Minnesota State Medical Association in 1895, and that his son, Dr. Justus Ohage, now of St. Paul, was president in 1954. Another outstanding combination of father and son concerns the Mayos. Dr. W. W. Mayo was president of the Association in 1873, and his sons, Dr. William J. Mayo and Dr. Charles H. Mayo, in 1894 and 1906, respectively.

It is truly an impressive honor and a notable experience to be able to complete fifty years in the service of mankind, to minister to the ills of the body, to soothe the restless spirits of many people, and to calm the disturbed emotions of many others. The practice of medicine is an honorable and noble profession. May it always be kept at this high level, and may people always have the opportunity to consult the physician of their own choice. May all physicians who are now practicing in Minnesota have the honor and privilege of pursuing their profession, so that one day they, too, may become members of the Fifty Club.

A large, elegant handwritten signature in dark ink, reading "J. M. Bergen". The signature is written in a cursive style with a large, sweeping loop at the beginning.

President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics
Minnesota State Medical Association
George Earl, M.D., Chairman

ACTIVITY IN WASHINGTON SLOWS; NEW FISCAL YEAR BEGINS

Early in July federal legislative activity slowed, with limited action on the following matters of interest to physicians:

Jenkins-Keogh Legislation

Pressing ahead with its campaign for enactment at this session of the Jenkins-Keogh legislation, the American Thrift Assembly has written President Eisenhower asking him to have the Treasury Department re-examine its position and endorse the bill. Lucius S. Smith, III, Secretary of the A.T.A., signed the letter sent to the White House. In it he recalls that the President had supported this type of legislation in the 1952 campaign and he added "if this legislation (H. R. 9 and 10) now contains any vice, it has eluded several of the foremost tax experts in the nation. It is a fact that up to this time no member of the Ways and Means Committee or of the Treasury, or any government spokesman has voiced a single valid objection to the 1947 bill. Certainly 'loss of revenue' cannot in our judgment successfully now be argued against this proposal."

A total of twenty-seven professional and business organizations—medicine, law, pharmacy, dentistry, entertainment and small business—are urging the passage of this legislation.

The differences between this proposal and social security have been pointed out by co-author Representative Keogh. He said the difference between the two approaches was that "the social security program is intended to provide the minimum benefits necessary for a subsistence standard of living. The Jenkins-Keogh proposal is intended to provide a second layer of benefits for retirement or survivorship purposes that would complement social security benefits and would raise the living standard of the recipients above the subsistence level to one that more nearly approximates the standard of living attained by the recipient during the productive years.

"Another difference arises from the nature of the two programs. Social security is a form of compulsory social insurance that is provided by

law to guard against destitution and poverty in a person's declining years or under circumstances of dire adversity. Jenkins-Keogh is a tax opportunity to practice individual thrift and frugality according to a person's needs and inclinations."

Reminder on Social Security for War-time Service

You are reminded again that if you were on active duty as a physician in the military or naval forces of the United States during the World War II period (September 15, 1940, through July 2, 1947) or the post-World War II period (July 2, 1947, through December 31, 1956) you may be eligible for social security wage credits of \$160.00 for each month of this active duty, provided your discharge from the services was an honorable one. These wage credits may be granted to those who died in service as well as to those who died after discharge.

The World War II period and the post-World War II period are treated separately. However, if you have active military service after 1956, you will receive wage credits for any active service after 1950 and before 1957, even though you get retired pay from your service department based on that service.

Credits for military service between September 15, 1940, and January 1, 1957, count the same as wages in civilian employment. These credits, however, are not actually listed on your social security earnings record. You do not need to take any action on them until you make an application for retirement benefits. Proof of your military service will be needed when you apply for retirement payments or when an application is made for survivors' benefits in the event of your death. Be sure to preserve your military or naval service records.

Doctor Draft Act in Effect July 1

The House Armed Services Committee, chaired by Representative Carl Vinson (D., Ga.), drastically rewrote the doctor draft bill proposed by the Defense Department, slapped down an

appeal by the military to increase the ratio of physicians to troops and gave formal approval to the bill. It was enacted two days after the hearing started.

Defense department representatives had proposed an amendment that would apply to physicians up through age thirty-five if they had received an educational deferment. At the same time, the department had decided not to continue the national, state and local medical advisory committees to Selective Service, headed by Dr. Howard Rusk. Nor was the department interested in carrying over several provisions of the old law that had been written in to protect the rights of the physicians and dentists inducted under the act. The Committee, however, did continue the Rusk committees and the other protective devices that the Defense department's bill had intentionally omitted.

The AMA wanted the phrase "physicians, dentists and allied specialists" changed to read "other specialists" to bring all scientists under the act, but this idea was dropped.

As soon as the last witness had been heard, the committee immediately went to work on formal approval of the bill. And in less than ten minutes except for the formalities of House and Senate voting—a new law was made.

New Loans Available to Physicians and Dentists

The Small Business Administration is now making loans available to physicians, dentists, architects, lawyers and other professions. To qualify, applicants need only be in private practice, solo or group. This is a most unusual and sudden step for SBA which up to now has limited its aid to retail businesses and small industry. Just over a year ago, SBA extended loan eligibility to proprietary hospitals and nursing homes. The federal loan agency is not publicizing this new policy other than to notify regional offices to start taking applications from doctors needing funds to build or remodel offices, purchase equipment or for any other constructive purpose.

Research Overhead Costs High

Medical school deans recently made a strong effort at Senate hearings on health appropriations to get more federal help in paying the overhead cost of research. The schools now have so many

grants for specific research projects, said the deans, that they are going broke just paying the overhead—heat, lights, janitor service and administrative costs.

Some Increases in Health Appropriations

Acutely economy-conscious this year, Congress trimmed the Administration's requests for funds in every appropriations bill to be sent to Capitol Hill since January. Even the one-package bill carrying operating funds for the Labor Department and the Department of Health, Education and Welfare was reduced \$11 million in the over-all, but the total allowed for the National Institutes of Health—\$211 million—actually was \$21 million more than the White House asked for. Of this \$21 million increase, \$9.5 million goes into cancer; heart, arthritis and neurology receive \$2.5 million each, and \$4 million goes to mental health. Two-thirds of the cancer raise is earmarked for chemotherapy investigations. The National Heart Institute will devote nearly one-half of its \$2.5 million increase to a study on aging. To broaden and stress research in gastroenterology, \$500,000 in research grants money has been turned over to the National Institute of Arthritis and Metabolic Diseases for distribution.

Study Shows Need for New Chemicals Law

A recent AMA study shows a "patchwork" of state and federal laws regarding the labeling of hazardous chemicals and points up the need for a uniform law. A fall conference of interested parties in government, industry and medicine is planned to draft the model law which will then be submitted to legislative bodies. The proposed legislation is intended to reduce careless and ignorant handling of potentially harmful products in and around the home, in small businesses and in other areas where control of over exposure to chemicals is not as efficient as in the manufacturing process. The law will require informative labeling, including listing of possibly harmful ingredients, their potentialities for harm, directions for safe use and first-aid instructions. At present only 52 per cent of the states require labeling of caustics and 10 per cent of industrial chemicals, although all states require labeling of narcotics and 93 per cent of drugs.

TWO GOVERNMENT AGENCY REPORTS CONCERN COST OF MEDICAL CARE

Two reports from government agencies answer some of the questions on "how big are the bills that doctors and hospitals charge?"

One is the continuing survey of medical expenses by the Bureau of Labor Statistics as part of its task of reporting on the cost of living. The other is the schedule of fees paid by "medicare." All the fees and prices given on the charts are the amounts that are charged families with \$5,000 income or less.

The facts, as reported, show some of the following:

1. Charges of physicians have risen more rapidly in the last five years than the general cost of living. Physicians' fees went up 19 per cent while living costs rose 6 per cent. However, over a longer period, from 1936 to date, the cost of living has gone up 101 per cent while medical charges have risen 78 per cent.

2. Hospital charges have had a spectacular rise. Those charges are nearly four times what they were in 1936. They went up 39 per cent in the last five years and are expected to continue to rise by about 5 per cent a year.

3. Medical and dental care for the American people at this time is costing an estimated \$16 billion a year. More than \$5 out of each \$100 of family expenditures goes for medical bills. This amounts to about \$280 a year for the average family. Twenty years ago this same family in terms of dollars adjusted to take out cost-of-living advances, was spending \$123 a year, or less than 4 per cent of the total family budget, on medical items.

Physician's charges as outlined in a table reported by the Bureau of Labor Statistics indicate that on an average, a doctor treating a patient in his office will charge from \$3 to \$5 per visit assuming that there are no laboratory tests to be made and no special services performed. A doctor visiting a patient at home will charge in the neighborhood of \$4 to \$7.50.

Charges of specialists are not detailed in the government's studies and there was a wide range in what surgeons charge different patients.

The average net income of self-employed physicians was estimated at about \$15,150 this year. This is a rise from \$3,220 in 1937 and from \$11,191 in 1951. Gross earnings of physicians are

much larger but net earnings amount usually about 60 per cent of gross.

This trend toward higher medical costs has led to the growth of private health insurance. In 1911 the first big plan for prepayment of medical expenses appeared. By 1941, hospitalization insurance covered 12.3 million people, surgical insurance 5.4 million. Now, 116 million have hospitalization insurance, 101 million surgical coverage.

Congress is interested in a government approach to medical insurance. President Eisenhower has planned to ease antitrust regulations so insurance companies can pool their resources in order to write high-risk types of insurance. The object is to lower the cost so more people can be covered, especially older persons and those in isolated rural areas, and to increase the number of illnesses covered.

POSSIBLE BATTLE LOOMS OVER CONTROL OF CORPORATION

By early July a probable proxy fight was shaping up over control of the Schering Corporation, manufacturer of pharmaceuticals. Revlon, Inc. served notice that it had acquired some 8.5 per cent of Schering stock and intends to go in the drug business.

This is probably the largest single block of Schering stock (all of its management owns less than one per cent) but other large blocks are known to be held in brokers' names.

FIGURES ON LIFE EXPECTANCY

The chance of living to a ripe old age in this country varies to a degree, state by state, and varies a good deal more by sex. A recent statistical study shows that women in all parts of the country outlive men by six years. Men live longer in a cluster of six states in west north central U. S.—Minnesota, North Dakota, South Dakota, Nebraska, Iowa and Kansas. The shortest average life span turns up in the southwestern states—Arizona, Nevada and New Mexico.

Little consideration has been given, until very recently even the *possibility* that different forms of tuberculosis or different types of pulmonary tuberculosis, might be more satisfactorily treated by different drug regimens. On present evidence, it seems highly probable that the best management of tuberculosis will prove to be, not a single drug regimen which is optimal for all cases (it seems to have been the goal and the orientation of most investigations up to the present time), but that different regimens will be found to best suit different forms or types of the disease.—CARL MUSCHENHEIM, M.D. *American Review of Tuberculosis*, July, 1955.

American Medical Association

REPORT ON ACTIONS OF THE HOUSE OF DELEGATES

JUNE 3-7, 1957

Revision of the Principles of Medical Ethics, relations with the United Mine Workers of America Welfare and Retirement Fund, the federal government's Medicare program, new standards for medical schools, a new statement on occupational health programs and the issue of Social Security benefits for physicians were among the wide variety of subjects acted upon by the House of Delegates at the American Medical Association's 66th Annual Meeting held June 3-7 in New York City.

Dr. Gunnar Gundersen of La Crosse, Wis., member of the AMA Board of Trustees since 1948 and chairman for the past two years, was unanimously chosen president-elect for the year ahead. Dr. Gundersen, who also was first chairman of the Joint Commission on Accreditation of Hospitals from 1951 to 1953, will become president of the American Medical Association at the June, 1958, meeting in San Francisco. There he will succeed Dr. David B. Allman of Atlantic City, N. J., who became the 111th president at the Tuesday night inaugural ceremony in the Grand Ballroom of the Waldorf-Astoria Hotel.

The House of Delegates voted the 1957 Distinguished Service Award of the American Medical Association to Dr. Tom Douglas Spies, head of the department of nutrition and metabolism at Northwestern University Medical School, Chicago, and director of the nutrition clinic at Hillman Hospital, Birmingham, Alabama, for his outstanding contributions to the science of human nutrition. For only the third time in AMA history, the House also voted a special citation to a layman for outstanding service in advancing the ideals of medicine and contributing to the public welfare. Recipient of this award was Henry Viscardi, Jr., of West Hempstead, New York, founder and president of Abilities, Inc., which employs only severely disabled persons.

Physician registration at the New York meeting had already reached an all-time high at 5 p.m. Thursday with 18,982 counted and scores of registration cards still unprocessed. The previous high was chalked up at the 1953 New York meeting when the five-day total was 17,958 physicians.

New Principles of Medical Ethics

The House approved the long-discussed revision of the Principles of Medical Ethics, originally submitted at the 1956 annual meeting in Chicago. The final version, presented by the Council on Constitution and Bylaws and then amended by

reference committee and House discussions in New York, now reads as follows:

Preamble.—These principles are intended to aid physicians individually and collectively in maintaining a high level of ethical conduct. They are not laws but standards by which a physician may determine the propriety of his conduct in his relationship with patients, with colleagues, with members of allied professions, and with the public.

Section 1.—The principal objective of the medical profession is to render service to humanity with full respect for the dignity of man. Physicians should merit the confidence of patients entrusted to their care, rendering to each a full measure of service and devotion.

Section 2.—Physicians should strive continually to improve medical knowledge and skill, and should make available to their patients and colleagues the benefits of their professional attainments.

Section 3.—A physician should practice a method of healing founded on a scientific basis; and he should not voluntarily associate professionally with anyone who violates this principle.

Section 4.—The medical profession should safeguard the public and itself against physicians deficient in moral character or professional competence. Physicians should observe all laws, uphold the dignity and honor of the profession and accept its self-imposed discipline. They should expose, without hesitation, illegal or unethical conduct of fellow members of the profession.

Section 5.—A physician may choose whom he will serve. In an emergency, however, he should render service to the best of his ability. Having undertaken the care of a patient, he may not neglect him; and unless he has been discharged he may discontinue his services only after giving adequate notice. He should not solicit patients.

Section 6.—A physician should not dispose of his services under terms or conditions which tend to interfere with or impair the free and complete exercise of his medical judgment and skill or tend to cause a deterioration of the quality of medical care.

Section 7.—In the practice of medicine a physician should limit the source of his professional income to medical services actually rendered by him, or under his supervision, to his patients. His fee should be commensurate with the services rendered and the patient's ability to pay. He should neither pay nor receive a commission for referral of patients. Drugs, remedies or appliances may be dispensed or supplied by the physician provided it is in the best interests of the patient.

Section 8.—A physician should seek consultation upon request; in doubtful or difficult cases; or whenever it appears that the quality of medical service may be enhanced thereby.

Section 9.—A physician may not reveal the confidences entrusted to him in the course of medical attendance, or the deficiencies he may observe in the character of patients, unless he is required to do so by law or unless it becomes necessary in order to protect the welfare of the individual or of the community.

Section 10.—The honored ideals of the medical profession imply that the responsibilities of the physician extend not only to the individual, but also to society where these responsibilities deserve his interest and participation in activities which have the purpose of improving both the health and the well-being of the individual and the community.

In approving the new Principles of Medical Ethics, the House of Delegates also reaffirmed the "Guides for Conduct for Physicians in Relationships with Institutions," adopted in 1951, and requested the Board of Trustees to devise and initiate a campaign to educate both physicians and the general public to the dangers inherent in the illegal corporate practice of medicine in its various forms.

Guides for Relations with UMWA Fund

In a key action on the basic issue of third-party intervention, as it affects the patient's free choice of physician and the physician's method of remuneration, the House adopted the "Suggested Guides to Relationships Between State and County Medical Societies and the United Mine Workers of America Welfare and Retirement Fund," which were submitted by the AMA Committee on Medical Care for Industrial Workers. In approving the guides, the House also recommended that the Board of Trustees study the feasibility and possibility of setting up similar guides for relations with other third-party groups such as management and labor union plans.

The statement, which outlines both medical society and UMWA responsibilities, contains these "General Guides":

1. All persons, including the beneficiaries of a third-party medical program such as the UMWA Fund, should have available to them good medical care and should be free to select their own physician from among those willing and able to render such service.
2. Free choice of physician and hospital by the patient should be preserved:
 - a. Every physician duly licensed by the state to practice medicine and surgery should be assumed at the outset to be competent in the field in which he claims to be, unless considered otherwise by his peers.
 - b. A physician should accept only such terms or conditions for dispensing his services as will insure his free and complete exercise of independent medical judgment and skill, insure the quality of medical care, and avoid the exploitation of his services for financial profit.
 - c. The medical profession does not concede to a third party such as the UMWA Welfare and Retirement Fund in a medical care program the prerogative of passing judgment on the treatment rendered by physicians, including the necessity of hospitalization, length of stay, and the like.
3. A fee-for-service method of payment for physicians should be maintained except under unusual circumstances. These unusual circumstances shall be determined to exist only after a conference of the liaison committee and representatives of the Fund.
4. The qualifications of physicians to be on the hospital staff and membership on the hospital staff is to be determined solely by local hospital staffs and by local governing boards of hospitals.

The Medicare Program

The House considered three resolutions dealing with the federal government's Medicare program for the dependents of servicemen. The delegate adopted one resolution condemning any payment under the Medicare program "to or on behalf of any resident, fellow, intern or other house officer in similar status who is participating in a training program." Government sanction of such payments, the House declared, would give impetus to the improper corporate practice of medicine by hospitals or other nonmedical bodies. Such proposals, the House added, would violate traditional patterns of American medical practices, seriously aggravate problems of hospital-physician relationships, encourage charges by hospitals for residents' services to patients not under the Medicare program, and create a variety of additional problems in such areas as medical licensure and health insurance.

In another action on Medicare, the House recommended that the decision on type of contract and whether or not a fee schedule is included in future contract negotiations should be left to individual state determination. In this connection however, the House restated the AMA contention that: the Dependent Medical Care Act as enacted by Congress does not require fixed fee schedules; the establishment of such schedules would be more expensive than permitting physicians to charge their normal fees, and fixed fee schedules would ultimately disrupt the economics of medical practice.

The House also suggested that the AMA attempt to have existing Medicare regulations amended to incorporate the Association's policy that the practice of anesthesiology, pathology, radiology and physical medicine constitute the practice of medicine, and that fees for services by physicians in these specialties should be paid to the physician rendering the services.

New Statement on Medical Schools

To replace the "Essentials of an Acceptable Medical School," initially approved by the House of Delegates in 1910 and most recently revised in 1951, the House adopted a new statement entitled "Functions and Structure of a Modern Medical School." Presentation of the document followed a year of careful study by the Council on Medical Education and Hospitals in collaboration with the Association of American Medical Colleges.

The statement is intended to provide flexible guides which will "assist in attaining medical education of ever higher standards" and "serve as general but not specific criteria in the medical school accreditation program." The document encourages soundly conceived experimentation in medical education, and it discourages excessive concern with standardization.

"No rigid curriculum can be prescribed for ac-

completing the objectives of medical education," it states. "On the contrary, it is the responsibility of the faculty of each school continually to re-evaluate its curriculum and to provide in accordance with its own particular setting and in recognition of advances in science a sound and well-integrated educational program."

Occupational Health Programs

The House also approved a new statement on the "Scope, Objectives and Functions of Occupational Health Programs," submitted through the Board of Trustees by the Council on Industrial Health. The Board report to the House said: "The statement describes and defines orthodox in-plant medical programs as understood in this country today and distinguishes clearly between such programs and the various plans for comprehensive medical care of the sick. It should help to resolve misunderstandings concerning the specialty of occupational medicine."

In adopting the statement, the House agreed with a reference committee report which declared that "the House has before it a statement which for the first time clearly defines the scope, objectives and functions of occupational health programs. It marks the needs and boundaries of occupational medicine. It states in a positive fashion the proper place of occupational health programs in the practice of medicine and it clearly charts the pathways of communication between physicians in occupational health programs and physicians in the private practice of medicine."

Social Security for Doctors

Two resolutions favoring compulsory inclusion of physicians in the federal Social Security system and another one calling for a nationwide referendum of AMA members on the issue were rejected by the House. The delegates reaffirmed their opposition to compulsory coverage of physicians under the Old Age and Survivors Insurance provisions of the Social Security Act. They also recommended a strongly stepped-up informational program of education which will reach every member of the Association, explaining the reasons underlying the position of the House of Delegates on this issue. The House at the same time reaffirmed its support of the Jenkins-Keogh Bills.

Miscellaneous Actions

In considering sixty-six resolutions and many additional reports from the Board of Trustees, councils and committees, the House also:

Congratulated the Board and the Committee on Poliomyelitis for their prompt action in stimulating national interest in the polio immunization program;

Recommended further study and a progressive program of action, probably including legislative

changes, to solve the problem of narcotic addiction;

Urged a more careful screening of television and radio patent medicine advertisements;

Directed the Board of Trustees to investigate the indiscriminate use of stimulants such as amphetamine, particularly in relation to athletic programs;

Directed the Speaker to appoint a committee of five House members to study the Heller Report, a management survey of the Association's organizational mechanisms;

Commended the Law Department for its special report on professional liability and urged state and county medical societies to establish claims prevention programs and to show the new film, "The Doctor Defendant";

Opposed the establishment of any further veterans' facilities for the care of non-service-connected illnesses of veterans;

Condemned the compulsory assessment of medical men and staff members by hospitals in fund-raising campaigns;

Commended the television program, *Dr. Hudson's Secret Journal*, its producers and its star, Mr. John Howard, for an outstanding contribution to the public interest and welfare, and

Recommended payment of transportation expenses of Section Secretaries for AMA meetings which they are required to attend.

Opening Session

At the Monday opening session, Dr. Dwight Murray, retiring AMA president, stressed the triple theme of the personal touch in medicine, the necessity for freedom in medical practice, and the need for professional unity. Dr. Allman, then president-elect, warned against the dangers of third-party contractual agreements involving fixed fee schedules. The Goldberger Award in nutrition research was presented to Dr. Paul Gyorgy of Philadelphia. An AMA citation was awarded to the Parke-Davis & Company for its continuing series of institutional advertisements telling the story of medicine and medical progress. Dr. H. G. Weiskotten, who retired after many years as chairman of the Council on Medical Education and Hospitals, received two bound volumes of letters of appreciation and also an ovation from the House of Delegates.

Inaugural Ceremony

Dr. Allman, in his Tuesday night inaugural address, declared that the physician is constantly striving for a balance between personal, human values, scientific realities and the inevitabilities of God's will. The inaugural ceremony, which was telecast over Station WABD-TV in New York, included presentation of the Distinguished Service Award to Dr. Spies and the special layman's citation to Mr. Viscardi. Also taking part in the program was the United States Army Chorus of Washington, D. C.

Election of Officers

In addition to Dr. Gundersen, the new president-elect, the following officers were selected by the House on Thursday:

Dr. Jesse Hamer of Phoenix, Arizona, vice president; Dr. George F. Lull of Chicago, secretary; Dr. J. J. Moore of Chicago, treasurer; Dr. E. Vincent Askey of Los Angeles, speaker; and Dr. Louis Orr of Orlando, Florida, vice speaker.

Four new members were elected to the Board of Trustees: Dr. George Fister of Ogden, Utah, to succeed Dr. James R. Reuling; Dr. Cleon Nafe of Indianapolis, Indiana, to succeed Dr. James R. McVay; Dr. James Z. Appel of Lancaster, Pennsylvania, to replace the late Dr. Thomas P. Murdock; and Dr. Raymond McKeown of Coos Bay, Oregon, to replace Dr. Gundersen. Dr. Edwin S. Hamilton of Kankakee, Illinois, was elected chairman of the Board at its organization meeting after the elections in the House.

Dr. Homer L. Pearson, Jr., of Coral Gables, Florida, was renamed to the Judicial Council. Two new members were elected to the Council on Medical Education and Hospitals: Dr. Clark Wescoe of Lawrence, Kansas, to succeed Dr. Weiskotten, and Dr. Warde B. Allan of Baltimore, Maryland, to succeed Dr. F. D. Murphy of Lawrence, Kansas.

For the Council on Medical Service, Dr. Robert L. Novy of Detroit, Michigan, was re-elected, and Dr. Hoyt Woolley of Idaho Falls, Idaho, was chosen to replace Dr. McKeown. Dr. Warren W. Furey of Chicago was re-elected to the Council on Constitution and Bylaws.

At the Wednesday session of the House the Illinois State Medical Society made a record state society contribution to the American Medical Education Foundation by turning over \$170,450 to Dr. Louis H. Bauer of New York, foundation president.

J. A. BARGEN, M.D.
O. J. CAMPBELL, M.D.
GEORGE EARL, M.D.
F. J. ELIAS, M.D.
*Delegates to the
American Medical Association*

NEW USE FOR GG

Gamma globulin injections appear to be a practical method for shortening the course of the skin disease, pityriasis rosea, provided they are given early enough, three University of Michigan researchers have reported. Among patients given gamma globulin during the first week of the eruption, the disease lasted an average of 17.3 days. The average untreated case required 31 days for the disease to run its course.—SALIN, R. W., CURTIS, A. C., and WHEELER, A., Ph.D.: Annual Meeting, AMA, New York City, June 7, 1957.

CONGESTIVE HEART FAILURE

(Continued from Page 567)

3. Luisade, A. D.: Paroxysmal Pulmonary Edema. In: Clinical Cardiovascular Physiology. New York Grune & Stratton, Inc., 1957, pp. 560-577.
4. Rubin, A. L.; Thompson, H. G., Jr.; Braverman, W. S.; and Luckey, E. H.: The management of refractory edema in heart failure. *Ann. Int. Med.* 42:358-368 (Feb.) 1955.
5. Lown, Bernard, and Levine, S. A.: Current concepts in digitalis therapy. *New England J. Med.* 250:819-832 (May 13); 866-874 (May 20) 1954.

PREVENTION OF SECONDARY HEMORRHAGE IN TONSILLECTOMY

In an article on "Prevention of Secondary Hemorrhage in Tonsillectomy" published in the July 1957 issue of the *Eye, Ear, Nose and Throat Monthly*, the author discusses the causes and prevention of secondary post-tonsillectomy hemorrhage.

Secondary hemorrhage occurs up to the fourteenth day, but more frequently on the fifth and sixth day post-operatively. Predisposing factors and causes of secondary hemorrhage include infections, trauma, febrile diseases occurring during convalescence, dietary deficiencies, hypertension, blood dyscrasias and certain drugs.[†] A careful history and physical examination plus indicated laboratory procedures and specific preoperative and post-operative care will minimize most of these causes of secondary hemorrhage.

Since most cases of secondary hemorrhage occur when the septic membrane is sloughing, it would appear that such bleeding is due to the action of infection under the membrane lining of the tonsillar cavity. Steps to reduce the amount of infection, therefore, will reduce the incidence of hemorrhagic complications.

Recently, a medicated chewing gum has been developed containing the antibiotics, Neomycin sulfate and Gramicidin, plus a local anesthetic Propesin.* The combination of antibiotics offers a broad spectrum of antibacterial action with a low degree of sensitization, the anesthetic produces marked relief from pain, and the chewing motion elicited by the gum provides much desired exercise of the throat muscles.

Patients were divided into two groups: one week those operated upon received the medicated gum, the next week the medication was not given. Observations were continued until seventy patients had been seen in each group. Only one instance of secondary bleeding developed in the treated group, while some hemorrhage was encountered in 20 per cent of the untreated group. The tonsillar fossae of the patients receiving the drug were uniformly cleaner and free from excessive granulation tissue. The parents of the patients were less anxious, as malodorous breath, so frequently encountered in the untreated patients, was absent. The chewing gum afforded better distribution of the medication than lozenges, and the chewing motion caused earlier use of the jaw muscles. Postoperative pain, severe enough to elicit one or more phone calls from the parents for assistance, was decidedly decreased in the treated group. No cases of hypersensitivity were noted in the entire series.—RITTENHOUSE, E. A.: *E.E.N.&T. Monthly*, 36:406 (July) 1957.

[†]Fox, S.: Laryngoscope, 62:414, 1952.

*Orabiotic-White Laboratories, Kenilworth, N. J.

Meetings and Announcements

TATE

Northern Minnesota Medical Association, annual meeting, Hibbing, Minnesota, September 6 and 7, 1957.

Southern Minnesota Medical Association, annual meeting, Lake City, Minnesota, September 9, 1957.

ATIONAL

American College of Gastroenterology, 22nd annual convention, The Somerset, Boston, Massachusetts, October 21, 22, 23, 1957.

American College of Physicians, Midwest regional meeting, Urbana, Illinois, October 12, 1957.

American Congress of Physical Medicine and Rehabilitation, thirty-fifth annual scientific and clinical session, Los Angeles, September 8-13, 1957.

American Gastroenterological Association, 59th annual meeting, Washington, D. C., May 30-31, 1958. L. M. Pollard, M.D., Secretary-General, University Hospital, Ann Arbor, Michigan.

Midwest Cardiac Conference, Iowa State University Hospitals, Iowa City, Iowa, October 3-5, 1957.

Ninth Postgraduate Assembly in Endocrinology and Metabolism, Medical College of Georgia, October 21-25, 1957.

San Diego Postgraduate Assembly, San Diego County Hospital, San Diego, California, September 18-19, 1957. For information, write Haddon Peck, Jr., M.D., 25 Hawthorn Street, San Diego 1, California.

INTERNATIONAL

Congress of International Society of Orthopedic Surgery and Traumatology, Barcelona, Spain, September 6-21. International Society of Orthopedic Surgery and Traumatology, 34 rue Montoyer, Brussels, Belgium.

Congress of International Society of Surgery, Mexico City, Mexico, October 27-November 2. Dr. L. DeJardin, 41 rue Belliard, Brussels, Belgium.

Fifth International Congress of Internal Medicine, Philadelphia, Pennsylvania, April 24-26, 1958. Edward C. Loveland, Secretary-General, 4200 Pine Street, Philadelphia 4, Pennsylvania.

Inter-American Congress of Pan American Medical Association, Mexico City, Mexico, November 18-22, 1957. Executive Director, Dr. Joseph J. Eller, 745 Fifth Avenue, New York 22, New York.

International College of Surgeons (United States and Canadian Section), 22nd annual congress (eye, ear, nose and throat and plastic surgery problems), Palmer House, Chicago, Illinois, September 8-12, 1957.

International Conference of Ultrasonics in Medicine, Statler Hotel, Los Angeles, California, September 6-7, 1957. John H. Aldes, M.D., Secretary, 4833 Fountain Avenue, Los Angeles 20, California.

AUGUST, 1957

International Congress of Psychiatry, Zurich, Switzerland, September 1-7, 1957. Prof. J. Wyrsh, Stans (Lucern), Switzerland.

Pan American Congress of Endocrinology, Buenos Aires, Argentina, November 3-9, 1957. Secretaria-General, Sociedad Argentina de Endocrinología y Metabolismos, Sante Fe 1171, Buenos Aires, Argentina.

Pan-Pacific Surgical Association, Seventh Congress, Honolulu, Hawaii, November 14-22, 1957. Dr. F. J. Pinkerton, Director General, Pan-Pacific Surgical Association, Room 230, Young Building, Honolulu, T. H.

World Congress of Gastroenterology, Washington, D. C., May 25-31, 1958. H. M. Pollard, M.D., Secretary-General, University Hospital, Ann Arbor, Michigan.

World Medical Association, Istanbul, Turkey, September 29 to October 5, 1957. Dr. Louis H. Bauer, 10 Columbus Circle, New York 19, New York.

NORTHERN MINNESOTA MEDICAL ASSOCIATION

The Northern Minnesota Medical Association will hold its annual meeting at Hibbing, Minnesota, Friday and Saturday, September 6 and 7, 1957.

The scientific program is as follows:

September 6

Morning Session - 10:00 A.M.

"Stevens-Johnson Syndrome"

DAVID SHER, M.D., Virginia

"The Early Detection and Treatment of Cancer of the Cervix"

DAVID DECKER, M.D., Rochester

"Life Saving Measures in the Severely Traumatized Patient"

JOSIAH FULLER, M.D., Duluth

"Disordered Action of the Heart as a Cause of Cardiac Failure"

RAYMOND D. PRUITT, M.D., Rochester

Afternoon Session - 2:00 P.M.

"The Vertebral Artery and its Relationship to Posterior Head Symptoms."

DONALD F. COBURN, M.D., Kansas City, Missouri

"Anti-Coagulation"

R. E. HANSON, M.D., Hibbing

"Perils and Hazards in Blood Transfusions"

VOLKER G. GOLDSCHMIDT, M.D., Duluth

Panel Discussion:

Moderator: WHITNEY WOODRUFF, M.D., Virginia

"The Patient with Cancer of the Breast"

(1) Surgical Aspects—Arnold J. Kremen, M.D., Minneapolis

(2) Radiological Aspects—Donn G. Mosser, M.D., Minneapolis

(3) Endocrine Aspects—Whitney Woodruff, M.D., Virginia

Evening Banquet

Speaker: Sigurd F. Olson, Ely
 Author of "The Singing Wilderness"
 Subject: "The Quetico-Superior Country"
 September 7

Morning Session - 9:00 A.M.

"Clinico-Roentgen-Pathological Conference"

Led by H. G. Moehring, M.D., Duluth

Adjournment - 12:00 Noon

SOUTHERN MINNESOTA MEDICAL ASSOCIATION

The annual meeting of the Southern Minnesota Medical Association will be held at The Terrace, Lake City, Minnesota, Monday, September 9, 1957. The following program has been scheduled.

Morning Session—9:00 A.M.

"The Problem of the Ruptured Diaphragm in the Injured Patient"

P. E. BERNATZ, M.D., Rochester

"The Advantages of Continuous Suction-drainage in the Management of a Variety of Surgical Wounds"

D. P. ANDERSON, M.D., Austin

"Clinical Significance of Prolapsed Gastric Mucosa"

DAVID DINES, M.D., Rochester

"Recurrent (18) Intestinal Hemorrhages due to Unrecognized Regional Enteritis"

P. W. BROWN, M.D., Rochester

Intermission

"The Results of Surgical Therapy for Angina Pectoris"

W. ROBERT SCHMIDT, M.D., Minneapolis

"Female Pseudohermaphroditism—The Adrenal Genital Syndrome"

E. J. RICHARDSON, M.D., St. Paul

"Treatment of Subarachnoid Hemorrhage"

ROSS H. MILLER, M.D., Rochester

"Cardiac Arrest with Cardiac Resuscitation—Case Report"

R. W. KEARNEY, M.D., Mankato

Luncheon and Business Meeting—12:00 M.

Afternoon Session—2:00 P.M.

"Criteria for Pediatric Psychiatry Referral"

MARY GIFFIN, M.D., Rochester

"Albers-Schönberg Disease (Marble Bone Disease)—Report of Case in One of Identical Twins"

J. T. OLIVE, M.D., Mankato

"Overuse of Steroid Therapy in Bronchial Asthma—Report of a Case"

G. A. PETERS, M.D., Rochester

"Management of Complications of Acute Nephritis in Childhood"

E. C. BURKE, M.D., Rochester

Intermission

"Left Sided Pneumatosis Coli—Case Report"

CHARLES NEUMEISTER, M.D., Minneapolis

"Constitutional Hepatic Dysfunction—An Unusual Cause of Jaundice in Childhood"

S. D. MILLS, M.D., Rochester

"Carcinoma of the Stomach Complicated by Pregnancy—Report of the Unusual Case"

ROBERT N. BOWERS, M.D., Lake City

Evening Session—6:30 P.M.

Banquet—The Terrace

"The French Regime on Lake Pepin"

DON MULDER, M.D., Rochester

MINNESOTA ACADEMY OF GENERAL PRACTICE

The Minnesota Academy of General Practice announces its seventh Annual Fall Refresher to be held at Hotel Leamington, October 15 and 16. The program, starting at 2 P.M. Tuesday, October 15, consists of ten hours of concentrated lectures by twenty-two outstanding medical teachers. Inquiries and reservation should be directed to the general chairman, John T. Pewters, M.D., 2020 1st Avenue So., Minneapolis.

SYMPOSIUM ON PERIPHERAL VASCULAR DISEASE

A Symposium on Peripheral Vascular Disease, sponsored by the Minnesota Heart Association and the Mayo Foundation, will be presented at the Mayo Clinic and Mayo Foundation, Rochester, Minnesota, September 23, 24 and 25, 1957. Speakers will include the following:

September 23

Robert J. Boucek, Research Associate, Howard Hughes Medical Institute, Miami, Florida

Ivan Frantz, Jr., University of Minnesota Hospital, Minneapolis, Minnesota

Howard B. Burchell, Professor of Medicine, Mayo Foundation, Rochester, Minnesota

Francis J. Haddy, Veterans Administration Research Hospital, Chicago, Illinois

Charles A. Owen, Associate Professor of Clinical Pathology, Mayo Foundation, Rochester, Minnesota

Irvine H. Page, Cleveland Clinic, Research Division, Cleveland, Ohio

Maurice B. Visscher, Professor of Physiology, University of Minnesota, Minneapolis, Minnesota

G. E. Wakerlin, Professor of Physiology and Head of Department of Physiology, University of Illinois, Champaign-Urbana, Illinois

Jack P. Whisnant, Instructor in Neurology, Mayo Foundation, Rochester, Minnesota

J. Léo Wright, Fellow, American Heart Association

September 24

Edgar V. Allen, Senior Consultant in Medicine, Mayo Clinic; Professor of Medicine, Mayo Foundation, Rochester, Minnesota

Nelson W. Barker, Professor of Medicine, Mayo Foundation, Rochester, Minnesota

Edward D. Bayrd, Assistant Professor of Medicine, Mayo Foundation, Rochester, Minnesota

Frank H. Bethell, Director, University of Michigan Thomas Henry Simpson Memorial Institute for Medical Research, Ann Arbor, Michigan

Jesse E. Edwards, Professor of Pathology, Mayo Foundation, Rochester, Minnesota

J. Earle Estes, Assistant Professor of Medicine, Mayo Foundation, Rochester, Minnesota

John F. Fairbairn, Consultant in Medicine, Mayo Clinic, Rochester, Minnesota

Ray Wallace Gifford, Instructor in Medicine, Mayo Foundation, Rochester, Minnesota

Harold D. Green, Professor and Director, Department of Physiology and Pharmacology, Wake Forest College Bowman Gray School of Medicine, Winston-Salem, North Carolina

Edgar A. Hines, Jr., Professor of Medicine, Mayo Foundation, Rochester, Minnesota

John L. Juergens, Instructor in Medicine, Mayo Foundation, Rochester, Minnesota

Clark H. Millikan, Associate Professor of Neurology, Mayo Foundation, Rochester, Minnesota

Richard M. Shick, Assistant Professor of Medicine, Mayo Foundation, Rochester, Minnesota

MEETINGS AND ANNOUNCEMENTS

A. Spittel, Jr., Instructor in Medicine, Mayo Foundation, Rochester, Minnesota

September 25

Theron Clagett, Professor of Surgery, Mayo Foundation, Rochester, Minnesota

James W. Culbertson, Professor of Internal Medicine and Director of Cardiovascular Research Laboratories, State University of Iowa, Iowa City, Iowa

Henry Ellis, Jr., Assistant Professor of Surgery, Mayo Foundation, Rochester, Minnesota

Arshak S. Gurdjian, Professor of Neurosurgery, Wayne University, Detroit, Michigan

John C. Ivins, Assistant Professor of Orthopedic Surgery, Mayo Foundation, Rochester, Minnesota

Walter F. Kvale, Associate Professor of Medicine, Mayo Foundation, Rochester, Minnesota

John M. Manger, Former Fellow in Medicine, Mayo Foundation, Rochester, Minnesota

William S. MacCarty, Associate Professor of Neurosurgery, Mayo Foundation, Rochester, Minnesota

Wright C. McGoon, Consultant in Surgery, Mayo Clinic, Rochester, Minnesota

John H. Moyer, Chairman, Department of Internal Medicine, Hahnemann Medical College and Hospital, Philadelphia, Pennsylvania

Harold M. Roth, Professor of Physiology, Mayo Foundation, Rochester, Minnesota

There is no registration fee. For information, reservations and information as to housing in Rochester, address Dr. Guy W. Daugherty, Chairman, Symposium Committee, 200 First Street Southwest, Rochester, Minnesota.

FELLOWSHIPS AVAILABLE FROM NATIONAL FOUNDATION FOR INFANTILE PARALYSIS

September 1 and December 1 are the current deadlines for applications to the National Foundation for Infantile Paralysis for post-doctoral fellowships in research, academic medicine or on the clinical field of psychiatry, rehabilitation, orthopedics, the management of poliomyelitis and preventive medicine. Financial support of the Fellow varies according to his previous education, his professional experience, marital status, and number of dependents. Compensation to the institution is arranged according to the program undertaken. For a full academic program, tuition and fees are allowed; for other programs, a sum not to exceed \$1,250.00 per year (includes tuition) is provided.

All awards are made upon recommendation of the appropriate National Foundation Fellowship Committee. U. S. citizenship is required, but those who have filed petition for naturalization will be considered. Partial fellowships are available for qualified veterans to supplement G.I. educational benefits. Applications must be received by September 1 for consideration in November, by December 1 for consideration in February, and by March 1 for consideration in May.

Postdoctoral Training in Research or Academic Medicine.—Awarded to applicants with an M.D., Ph.D., or equivalent degree for basic or advanced training in laboratory research in medicine and the related biologic and physical sciences. This program is *not* intended for experienced investigators who need support for a research project. Financial benefits, in addition to the

compensation to the institution, vary from \$3,600 to \$6,000 a year. Under unusual circumstances, higher stipends may be permitted. Transportation not to exceed \$600 may be paid if foreign study is approved.

Postdoctoral Study in the Clinical Fields:

1. **Rehabilitation.**—For licensed physicians interested in rehabilitation as it relates to their specialty and who wish to study the concept and basic techniques of rehabilitation. One year of internship is required and license to practice in the United States. For residents who wish specialty training in Physical Medicine and Rehabilitation, awards are made for a period of one, two, or three years, depending upon the time required to complete eligibility requirements for certification by the American Board of Physical Medicine and Rehabilitation. Preference is given to applicants under forty years of age. Financial benefits, in addition to compensation to the institution, are \$300 or \$350 per month depending on marital status, with \$25 additional for each dependent child.

2. **Psychiatry.**—For licensed physicians who have had two years of graduate training in psychiatry acceptable to the American Board of Psychiatry and Neurology, and who are interested in the emotional problems of patients with physical disabilities. The program of study is to be undertaken in a setting where medical and associated medical personnel are engaged co-operatively in a program of comprehensive patient care. Interest in research and teaching are highly desirable. Awards are made for a period of one year and are subject to renewal. Financial benefits, in addition to the compensation to the institution, vary from \$3,600 to \$6,000 a year. Under unusual circumstances, higher stipends may be permitted.

3. **Orthopedics.**—For surgeons who have completed requirements for certification by the American Board of Orthopedic Surgery (or who have had equivalent training) and who are interested in advanced study in orthopedics in preparation for teaching or research. The age limit is thirty-six. Awards are made for a period of one year and are subject to renewal. Financial benefits, in addition to the compensation to the institution, vary from \$4,500 to \$6,000. Under unusual circumstances, higher stipends may be permitted.

4. **The Management of Poliomyelitis.**—For licensed physicians who wish to acquire a knowledge of the various aspects of the total care of poliomyelitis patients. A fellowship for one year for full time study may be undertaken at any institution having suitable facilities and staff for this type of program. One year of internship is required. Financial benefits are \$300 or \$350 per month depending on marital status, with \$25 additional for each dependent child. Compensation to the institution is also arranged.

5. **Preventive Medicine.**—For physicians who desire to prepare for the teaching of preventive medicine. Applicants must have had two years of training and experience, including responsibility for teaching, in one of the areas related to preventive medicine. Awards are

made for a period of one year and are subject to renewal. Financial benefits, in addition to the compensation to the institution, vary from \$4,500 to \$6,000 a year. Under unusual circumstances, higher stipends may be permitted.

Short Courses in the Care of the Poliomyelitis Patient.—Fellowships are offered to doctors, nurses, physical therapists and occupational therapists to attend short courses (one week to three months) in the care of the poliomyelitis patient. A list of institutions offering such courses will be sent on request. Maintenance, transportation and tuition if required, will be paid. Applicants will be expected to attend the course nearest their place of residence if the course is of less than three months' duration. Doctors and nurses should apply to their local chapters of the National Foundation. Physical therapists and occupational therapists should apply to the Division of Professional Education of the National Foundation. Applications must be filed at least six weeks before the course begins.

For further information write to: Division of Professional Education, National Foundation for Infantile Paralysis, 301 East 42nd Street, New York 17, New York.

NEW LAW ON EMERGENCY ADMISSIONS TO STATE MENTAL HOSPITALS

The 1957 Minnesota legislative session passed an act relating to the emergency admissions of patients to state mental hospitals. This act is Chapter 70, Laws of 1957, and became effective March 5, 1957.

The amendment provides that a patient may be admitted as an emergency to a state mental hospital upon written certification by a physician that the patient is mentally ill and is likely to harm himself or others. The hospital superintendent must give consent to the admission. The purpose of the amendment is to avoid holding a mentally-ill person in jail in the rare instance when the probate judge is out of town or unavailable for some other reason. It is anticipated that this procedure will be used in only the most unusual cases and then as a temporary measure, for the certification can be effected for only a seventy-two-hour period. Prior to expiration of this three-day period, if so indicated, the probate court is petitioned for the usual commitment.

Certification forms have been prepared and may be obtained at the state mental hospitals or at the county welfare offices.

ESSAY CONTEST

Prizes for the 1958 essay contest sponsored by the Association of American Physicians and Surgeons Freedom Programs, Inc., have been announced. There will be a \$1,000 first prize, a \$500 second prize, and a \$250 third prize. In addition there will be four prizes of \$100 each and seven prizes of \$75 each. Certificates of "meritorious achievement" are awarded to all contestants whose essays reach the national finals.

This contest, which the Minnesota State Medical Association voted to co-sponsor at its recent annual meet-

ing, is open to high school students, and the choice of topics includes "The Advantages of Private Medical Care" and "The Advantages of the American Free Enterprise System." A Minnesota girl, Sonia Gustavs of Olivia, won the 1957 national contest. She was sponsored by the Renville-Redwood County Medical Society.

PATHOLOGISTS MEET

The annual spring meeting and seminar of the Minnesota Society of Clinical Pathologists was held at St. Joseph's Hospital, St. Paul, on May 14, 1957. The regular all-day tumor seminar was moderated by Dr. William A. Meissner of Boston who is associate professor of pathology at Harvard Medical School and pathologist at the New England Baptist and Palm Memorial Hospitals, Boston.

The eleventh annual Arthur H. Sanford Lecture sponsored by the Minnesota Society of Clinical Pathologists, was given by Dr. Arthur T. Hertig of Boston who is the Shattuck professor of pathology at Harvard Medical School. This lecture was given before a general session of the Minnesota State Medical Association, and its title was "Essentials of Endometrial Pathology."

A dinner and business meeting were held at which the following officers were elected: President: Dr. Lyman A. Weed, Rochester; Vice-president, Dr. Harold F. Joffe, Virginia; local councilor, Dr. Arthur C. Auderheide, Duluth. Officers who were held over from previous terms were two local councilors, Dr. Frederic H. Lott, Minneapolis, Dr. Malcolm B. Dockerty, Rochester, and the secretary-treasurer and ASCP councilor Dr. George G. Stilwell, Rochester.

UNIVERSITY COURSE ON ADVANCED ORAL PATHOLOGY

The Medical and Dental Faculties of the University of Minnesota will present a course in "Advanced Oral Pathology" during the week of April 28 through May 2, 1958. Both lectures and pathologic slide study will be included. The subjects covered will be: neoplastic and non-neoplastic diseases of the salivary glands, neoplasms of dental origin, bone pathology, soft tissue neoplasms, dermatologic pathology, diseases of the lymphoid system, and oral roentgenographic evidences of systemic disease.

The faculty will include Dr. Robert Lukes, Armed Forces Institute of Pathology; Drs. D. C. Dahlin and Edward Stafne of the Mayo Clinic; Dr. Robert Goltz of the Medical School, University of Minnesota; and Drs. Anand Chaudhry and Robert J. Gorlin of the School of Dentistry, University of Minnesota.

The tuition fee will be \$50, and an additional \$50 will be charged if room and board at the Center for Continuation Studies are desired. Further information may be obtained from Dr. Robert J. Gorlin, Chairman, Division of Oral Pathology, School of Dentistry, University of Minnesota, Minneapolis, Minnesota.

CONTINUATION COURSES

Medical continuation courses to be presented at the Center for Continuation Study, University of Minnesota, this fall are:

- September 24-26
Pediatrics for Specialists
- October 7-9
Obstetrics for General Physicians
- October 24-26
Symposium on Skin Cancer for Specialists

For further information concerning the above courses, write to the Director, Department of Continuation Medical Education, 1342 Mayo Memorial, University of Minnesota, Minneapolis 14.

FILMS AVAILABLE FOR MEDICAL GROUPS

"Monganga," the outstanding "March of Medicine" television presentation, produced by the Smith, Kline and French Laboratories in co-operation with the AMA, has been made available to medical groups before release to the general public. It is a full color, 16 mm. sound film which describes the work of Dr. John Ross, a medical missionary in the Belgian Congo. Information about the film and reservations for showing dates may be secured from the Film Center, Smith, Kline and French Laboratories, 1530 Spring Garden Street, Philadelphia 1, Pennsylvania.

The Upjohn Company now has a limited number of 16 mm. sound kinescopes (films) of their fifth Grand Rounds closed-circuit television program, "Diagnostic and Therapeutic Advances in Liver Disease." Showing time is ninety minutes. This film, as well as films of the first four Grand Rounds ("Acute Abdominal Problems," "The Cardiac Patient in Stress," "Borderlines of Cancer," and "Pre-Malignant and Malignant Lesions of the Breast and Colon") are available without charge for showing before any group in the Medical or allied professions. To make arrangements for a local showing, contact your local Upjohn representative, your nearest Upjohn branch office, or R. P. Trubey, head of the professional advertising department, The Upjohn Company, Kalamazoo, Michigan.

The second film in the AMA-American Bar Association series on "Medicine and the Law" deals with prevention of professional liability action. Titled "The Doctor Defendant," the film is available from the AMA Film Library for medical society showings. It is a companion to "The Medical Witness" in the series produced by the William S. Merrell Company in co-operation with the AMA and ABA.

LABORATORY ASSISTANTS GRADUATE IN SEPTEMBER

Upon satisfactory completion of the course for laboratory assistants of the general extension division of the University of Minnesota, twenty students will receive certificates on September 28. The students are trained to do hemoglobin determinations, white blood cell counts, red blood cell counts, normal differential smears and

recognition of an abnormal smear, routine urinalysis, titration of gastric acidity, BMR tests, blood group typing and limited blood chemistry determinations (sugar, urea nitrogen, chloride). The students are best qualified to work in physician's office or to assist a registered medical technologist (M.T., ASCP) in a hospital or clinical laboratory. Information about the students and the training program may be obtained from Verna Rausch, assistant professor of medical technology, C205 Mayo Building, University of Minnesota, Minneapolis 14, Minnesota.

PRESERVATION OF BOOKPLATES

(Continued from Page 585)

probably the building of the American Antiquarian Society of Worcester, Massachusetts. This Society's collection was begun with the gift of the private collection of Rev. Herbert E. Lombard, numbering 40,000, in 1934. At that time he wrote in the Year Book of the American Society of Bookplate Collectors and Designers, "It is strongest in early American plates, though practically (and in many cases entirely) complete in E.D.F., J.W.S., S.L.S., A.N.M., W.F.H., T.C. and other artists." By these initials he referred to Edwin Davis French of Saranac Lake, America's best known designer and engraver of the modern bookplate; J. Winfred Spenceley, contemporary of French, etcher and engraver; Sidney L. Smith of Boston; A. N. Macdonald; William F. Hopson, engraver of New Haven, and Timothy Cole, engraver on wood; all of whom won international recognition.

The Print Department, Metropolitan Museum of Art, New York City, is a famous depository. The William E. Baillie Collection of more than 20,000 items came to the museum in 1920. The Print Room is open week days from 10 to 4:45, except Saturday, when it is open from 10 to 1:00. It is closed on Sunday.

CLEORA WHEELER
Designer and Illuminator

ESOPHAGITIS WITH HIATUS HERNIA

(Continued from Page 562)

- Gröndahl operations with and without vagotomy. Surgery: 34:742, 1953.
- 9. Brackney, E. L., Kelly, W. D., Campbell, G. S., and Wangenstein, O. H.: Esophagitis in dogs following operations employed in the treatment of megaesophagus. Proc. Soc. Exper. Biol. & Med., 84: 134, 1953.
- 10. Nissen, R.: Gastropexy as the lone procedure in the surgical repair of hiatus hernia. Am. J. Surg., 92: 389, 1956.

Woman's Auxiliary

WOMAN'S AUXILIARY TO AMA HOLDS 34TH ANNUAL CONVENTION

The 34th annual convention of the Woman's Auxiliary to the American Medical Association was held in New York concurrently with the 106th annual meeting of the AMA, June 3-7, at the Roosevelt Hotel.

Registered as delegates from Minnesota were Mrs. Karl Anderson, Minneapolis; Mrs. H. E. Bakkila, Duluth; Mrs. George Earl, St. Paul; Mrs. Reuben Erickson, Minneapolis; Mrs. L. P. Howell, Rochester; Mrs. A. J. Lenarz, Browerville; Mrs. J. P. Medelman, St. Paul; Mrs. C. L. Oppgaard, Crookston; Mrs. C. L. Sheedy, Austin; Mrs. William F. Skaife, Little Falls; Mrs. George Snyder, St. Paul, and Mrs. H. B. Sweetser, Minneapolis. We were allowed twenty-three delegates, but as few of the other delegations were complete, we did not feel that this was a bad representation.

On Monday, June 3, there were concurrent round table discussions on legislation, public relations, program, organization, *Today's Health*, the American Medical Education Foundation, publications, newsletters and *Bulletin*. We recessed in time to attend the complimentary tea at the Tavern-on-the-Green in Central Park. This tea, which was given by one of the pharmaceutical firms, honored Mrs. Robert Flanders, the national president, and Mrs. Paul Craig, president-elect.

The convention opened formally on Tuesday, June 4, at 8:45 a.m. with the usual formalities: invocation, pledge of allegiance to the flag, the Auxiliary pledge of loyalty, greetings from the president of the New York County Medical Society and the general convention chairman. The address of welcome was given by the immediate past president of the Woman's Auxiliary to the State Medical Society of New York and the response by the president of the Woman's Auxiliary to the Utah State Medical Association.

Mrs. Flanders introduced the Auxiliary convention chairmen: Mrs. Harry Pohlmann and Mrs. E. V. B. Vurgason, and the president-elect, Mrs. Craig.

After the memorial service honoring our eleven Auxiliary members as well as those from every state who had died during the past year, Mrs. Flanders gave her address in which she said that she had never felt that her cause was not the right one nor that she was walking alone. She thanked all for giving her the opportunity for service.

Reports of the state presidents on Wednesday and Thursday showed increased activity in all the states on the priority projects of AMEF, *Today's Health* and increasing activity also in the field of legislation and the various phases of AMA activity. Minnesota is one of the few states that has started working with the auxiliary to the student AMA, and in various phases of safety and mental health.

One of the highlights of the conference was the address of Dr. Howard Rusk, professor and chairman of

the Department of Physical Medicine and Rehabilitation at Bellevue Medical Center, New York University. His topic was "Sick People in a Troubled World," and in a very refreshing manner he warned us that, as our husbands had added years to the life span, it was part of our responsibility to add life to those years. He called our attention to the tools of rehabilitation and felt that we had a difficult and important role to play in trying to build a cornerstone in human understanding. In his travels in foreign countries he felt that our rehabilitation of handicapped people was accomplishing more goodwill than some of our other expenditures.

Wednesday sessions continued with reports of national chairmen and reports of the election committee of the 1958 nominating committee.

At the luncheon honoring Mrs. Flanders and Mrs. Craig, Dr. Allman and Dr. Murray spoke, and the trustees and officers of the AMA were honored guests. Mrs. Flanders presented Dr. George Lull with a check for \$113,518.77 for AMEF.

Thursday's meeting was an anticlimax as far as excitement was concerned.

The election of the slate presented by the nominating committee was accepted. Mrs. E. Arthur Underwood, Vancouver, Washington, is president-elect. It was decided to incorporate the Auxiliary on the advice of the AMA legal staff so, until that is worked out, no amendments should be passed.

Mrs. Craig was installed as president of the Auxiliary and delivered her masterful address entitled "Health: A Joint Endeavor," which will be printed verbatim in the fall issue of *Bulletin*. She stressed that a changing world brings changing problems of sudden death, multiple injuries and problems of rehabilitation; it also brings new age patterns, more older citizens and new neighborhood patterns. There is urgent need to keep emotional health in a technologically difficult world. Mrs. Craig also said that there is now new meaning in the art of living together with minds and hearts sensitive to the relationships between people. There is increasing significance and importance in high moral values. This is the frontier on which we can pioneer improving working knowledge of human relations and group behavior. We must simplify and streamline our organization and develop ideas.

The national projects to be given priority are AMEF and *Today's Health*. We should also stress greater understanding of Auxiliary fundamentals, the AMA and human relations and group behavior.

At her post-convention board meeting, Mrs. Craig attempted to set the pitch for the fall conference for Presidents and Presidents-elect which will be a "how-to-do-it" conference with the emphasis on group relationships. She stressed that we must remember these basic concepts:

- . We are a working community service group rather than just a meeting type of organization.
- . We can do our most productive work under the direct guidance of the medical society.
- . We should continuously evaluate our projects to help us judge whether we are carrying out our objectives.
- . We will want to utilize methods to suit changing times and the best resources from the educational field.
- . We must develop our activities to give motivation and a sense of participation and achievement to the individual member. With these ideas to guide us, Mrs. Cig hoped that we may better learn how to assist in programs for the advancement of medicine and public health and to promote mutual understanding among physicians' families—the objectives which bring us together and upon which all of our work is based.

MRS. C. L. OPPEGAARD, *President*

MINNESOTA AUXILIARY CHAIRMEN APPOINTED

State committee chairmen for the 1957-58 year include:

- Medical Careers.....
Mrs. S. M. Loken, St. Paul (Nursing)
Mrs. E. H. Soule, Rochester (Other careers)
- M.E.F.....Mrs. M. D. Starekow, Thief River Falls
- Archives.....Mrs. James L. Benepe, St. Paul
- Bulletin.....Mrs. A. W. Diessner, Redwood Falls
- Cancer.....Mrs. W. O. Finkelnburg, Winona
- Civil Defense.....Mrs. Vernon Sommerdorf, St. Paul
Mrs. Leo A. Nash, St. Paul
- Finance.....Mrs. Charles Froats, St. Paul
- Physician Doctor's Wife.....Mrs. C. E. Carlson, Alexandria
- Health Days and Health Education.....
Mrs. Conrad Karleen, Minneapolis
- Memorial.....Mrs. Howard Satterlee, Lewiston
- Legislation.....Mrs. L. Raymond Scherer, Minneapolis
- Magazines for Friendship.....
Mrs. L. J. Leonard, Minneapolis
- Medical and Surgical Relief.....
Mrs. Clarence Jacobson, Chisholm
Mrs. Warren Wilson, Northfield
- Mental Health.....Mrs. William Gjerde, Lake City
- Minnesota Medicine.....Mrs. A. B. Rosenfield, Minneapolis
- Organization.....Mrs. Reuben Erickson, Minneapolis
- Press and Publicity.....Mrs. Harold Ulvestad, Minneapolis
- Printing and Roster.....Mrs. L. R. Boies, Hopkins
- Program Co-ordinator.....
Mrs. Harold Benjamin, Minneapolis
- Public Relations.....Mrs. M. O. Wallace, Duluth
- Resolutions.....Mrs. A. J. Lenarz, Brownville
- Revisions.....Mrs. Harold Wahlquist, Minneapolis
- Safety.....Mrs. Ralph L. Olson, St. Paul
- Social.....Mrs. Robert Priest, Minneapolis
Mrs. E. T. Evans, Minneapolis
Mrs. John Meade, St. Paul
Mrs. Wallace Gleason, St. Paul
Mrs. E. E. Barrett, Duluth
Mrs. R. E. Davis, Waseca
- Today's Health.....Mrs. H. P. VanCleve, Austin

HEADACHES MAY BE SYMPTOM OF MORE SERIOUS DISORDERS

Headaches, often rated man's most common and annoying complaint, may be either important or unimportant from a medical standpoint. However, a bulletin from the Minnesota State Medical Association warns that the person who indulges in prolonged self-medication for persistent, severe headaches may be in for some serious illness if he does not seek professional help.

Fortunately, the ordinary headache ends within twenty-four hours but when it is more severe and the causes obscure, extensive medical measures may be required. The migraine is a severe headache usually starting on one side of the head with additional varied and individual symptoms. Many migraine victims could attain comfort if they tried to correct faulty modes of living and eliminate undesirable environmental factors.

Women are especially subject to headaches for a number of reasons; menstrual difficulties, for one. For this cause, the doctor can prescribe drugs which give a great deal of relief but they must be used with understanding and discretion.

Pregnant women are also subject to difficulties which may first be detected by severe headaches; one of the first symptoms of toxemia, for example, is blurred vision accompanied by headaches.

For both men and women, the middle-age years mean a time when the activity of the sex glands declines; in both sexes there may be frequent annoying headaches at this time of life.

Headaches have even been known to be caused by "caffeine withdrawal." For many individuals, coffee produces a sense of well-being and going without it for a time can cause frequent headaches.

Occupational diseases may also cause headaches. Toxic industrial hazards including gases, dusts, vapors, smoke, fumes, liquids, chemical agents and explosive mixtures may be contributing factors to headaches, dizziness and visual disturbances.

Among the more serious causes of headaches are strokes and arteriosclerosis or hardening of the arteries.

Of course, adequate treatment of a complaint in or about the head depends on a correct diagnosis of the cause. Anyone who suffers from chronic head pain should put himself under the care of a competent physician as soon as possible.

BACKACHES POSE DIFFICULT DIAGNOSTIC PROBLEM

A person may have congenital defects in his back, and even structural changes, but still not have clinical symptoms, according to a report by Drs. Tom M. Fullenlove and A. Justin Williams, of San Francisco, in an article on x-ray studies in pre-employment physical examinations published in the April, 1957, issue of *Radiology*.

Conclusions advanced by the two San Francisco physicians were based on a study of 200 persons without any backaches as compared with another 200 persons who had suffered from the complaint. However, in each of the two groups there was just about an equal distribution of both congenital defects and structural changes.

Other conclusions from their study:

—Congenital defects or anatomical variations are not independently a cause of backache.

—A great many backaches may be the result of soft tissue changes, which are not seen on a plain x-ray film. These changes would include strains, sprains and inflammations.

In Memoriam

FRANK E. BURCH

Dr. Frank E. Burch, nationally-known St. Paul ophthalmologist, died June 30, 1957, at his summer home near Two Harbors, Minnesota. He was eighty-nine years old.

Born in Menomonie, Wisconsin, Dr. Burch graduated from the University of Minnesota Medical School in 1897. He interned at St. Luke's Hospital, St. Paul, and took postgraduate work at Johns Hopkins University, Baltimore, at the Royal London Ophthalmic College and at the University of Vienna. He entered general practice at Glencoe, Minnesota, and remained there for two years. In 1904 he moved to St. Paul and remained in active practice there until he retired in 1946.

Dr. Burch was professor and chief of the department of ophthalmology at the University of Minnesota as well as ophthalmologist for the University Hospitals and Miller Hospital, St. Paul. He was a past president of the American Academy of Ophthalmology and Otolaryngology, secretary of the Minnesota Society for the Prevention of Blindness and a member of the advisory committee of the National Society for the Prevention of Blindness. In 1940 he spent four months in Peiping, China, as visiting professor of Peiping Union Medical College under the auspices of the Rockefeller Foundation.

He was a past president of the Ramsey County Medical Society, the Minnesota Academy of Medicine, the Minnesota Academy of Ophthalmology and an active member of the American Ophthalmological Society, the Minnesota State Medical Association and the American Medical Association. In 1937 he was the United States Delegate to the International Congress of Ophthalmology held in Cairo, Egypt.

Dr. Burch is survived by his son, Dr. Edward P. Burch, St. Paul; a daughter, Mrs. Glen S. Taylor, Palo Alto, California, and three grandchildren.

DETLOF E. JOHNSON

Dr. Detlof E. Johnson, South St. Paul physician, died June 30, 1957. He was fifty-five years old.

A native of Stillwater, Minnesota, Dr. Johnson attended Macalester College, St. Paul, and graduated from the University of Minnesota Medical School. He served his internship at Ancker Hospital, St. Paul.

Dr. Johnson practiced medicine in Duluth for a number of years as well as in St. Paul and South St. Paul. He was on the staff of St. John's Hospital, St. Paul, and a former member of the St. Louis County Medical Society, the Ramsey County Medical Society, the Minnesota State Medical Association and the American Medical Association.

Survivors include his wife, Alice, and two daughters, Mrs. Ronald Jorgenson, Fargo, North Dakota, and Carolyn, South St. Paul.

JOHN VINCENT KELLY

Dr. John V. Kelly, a practicing physician in St. Paul for forty-five years, died June 20, 1957. He was seventy-four years old.

He had retired from active practice last January and was the last survivor of three brothers who were physicians in St. Paul.

Dr. Kelly was born in St. Paul, attended Cret High School and the University of Minnesota. He graduated from Marquette University in 1911 and began to practice in St. Paul the same year.

He was a member of the Ramsey County Medical Society, the Minnesota State Medical Association, the American Medical Association and was a staff member of St. Joseph's and St. Luke's Hospitals, St. Paul.

Survivors include his wife, Agnes; four daughters: Mrs. C. E. deRosier, Mrs. James E. Budge, Mrs. Eugene Daugherty, and Mrs. Russell Jensen, all of St. Paul; two sons: Dr. Edward H. Kelly, St. Paul, and Major John V. Kelly, Jr., Riverside, California, and one sister, Miss Margaret Kelly, St. Paul. There are twenty-one grandchildren.

GEORGE F. REINEKE

Dr. George F. Reineke, a resident of New Ulm, Minnesota, for over fifty years, died at his home May 21, 1957. He was eighty-six years old.

Dr. Reineke was born in Waseca county, graduated from the University of Minnesota Medical School in 1896 and settled in New Ulm immediately after graduation. In 1903 he went to Vienna for a postgraduate course in diseases of the eye, ear, nose and throat. He retired from active practice several years ago after maintaining an office in the Fritsche block for many years. He was a member of the Brown County Medical Society, the Minnesota State Medical Association, the American Medical Association and the American Academy of Ophthalmology and Otolaryngology.

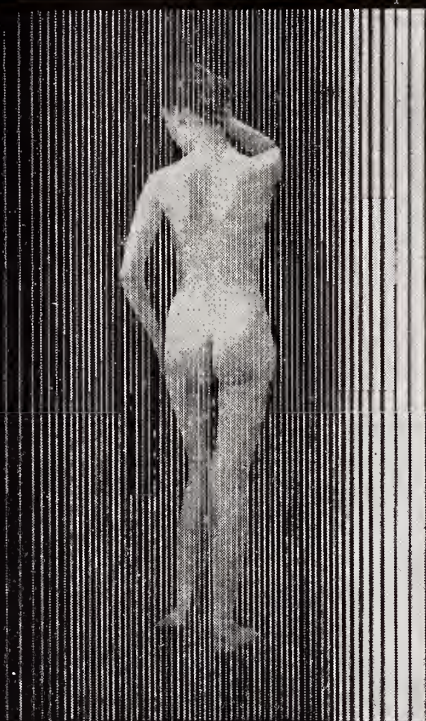
In addition, he was active in civic affairs in New Ulm for many years; he served as Brown county coroner from 1910 to 1951 and was a member of the New Ulm school board from 1904 to 1919. He was New Ulm health officer from 1900 to 1903 and an active member of the Methodist church, serving as lay minister and as trustee from 1918 to 1935.

A director of the New Ulm Savings and Loan Association, he served as president of the Association for thirty-five years. He was a member of the Charity Lodge, A. F. & A. M., New Ulm chapter, R. A. M., DeMolay Commandery, a past patron of the Orient Chapter, O.E.S., and Zuhrah Temple, Minneapolis.

Survivors include his wife, Anna; a son, Dr. Harold G. Reineke, Cincinnati, Ohio; a daughter, Mrs. Palmer Swenson, Dawson, Minnesota; and four brothers: Louis, Waseca, Minnesota; the Rev. Ernest, Lake City, Minnesota.

(Continued on Page A-30)

EFFECTIVE, DEPENDABLE THERAPY FOR VAGINITIS



*"...results for
trichomoniasis
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1. Pitt, M. B.: Leukorrhea. Causes and Management, J. M. A. Alabama 25:182 (Feb.) 1956.
2. Parker, R. T.; Jones, C. P., and Thomas, W. L.: Pruritus Vulvae, North Carolina M. J. 16:570 (Dec.) 1955.

SEARLE

(Continued from Page 602)

nesota; Albert, San Antonio, Texas; and Rudolph, August, Missouri and one sister, Mrs. Clifford Thompson, Faribault, Minnesota.

EDWARD D. RISSE

Dr. Edward D. Risser, former Winona, Minnesota, physician, died at his home in Pasadena, California, May 1, 1957. He was sixty-six years old.

Dr. Risser, an eye, ear, nose and throat specialist, practiced in Winona from 1921 to 1943 when he moved to California. He was born in Des Moines, Iowa, and received his medical education at the University of Iowa.

Dr. Risser had been a member of the Winona County Medical Society and the Minnesota State Medical Association. He also belonged to the Los Angeles County Medical Association, the California Medical Association, the American Medical Association, the Pacific Coast Oto-Ophthalmological Society and the American Academy of Ophthalmology and Otolaryngology. He served on the staffs of St. Luke's, Huntington Memorial and Alta Vista Hospitals, all in Pasadena.

Other memberships included the Pasadena Consistory of the Masonic order, the University Club of Pasadena and the First Methodist Church. In Winona he was a member of Central Methodist Church and Winona Lodge 18, A.F.&A.M.

Dr. Risser is survived by his wife, Mona; three daughters: Mrs. Walter J. Vernon, National City, California; Mrs. George R. Atkins, Oakland, California, and Mrs. H. James Christian, Danville, California; one son, Edwin J., Berkeley, California; two brothers: Dr. Joseph C. and J. Raymond, Pasadena; one sister, Katherine, Pasadena, and eight grandchildren.

FRANCIS J. SCHATZ

Dr. Francis J. Schatz, prominent St. Cloud, Minnesota, physician for more than thirty-six years, died May 28, 1957. He was seventy-four years old.

Dr. Schatz, by his own count, had delivered more than 9,500 babies in his lifetime. Before moving to St. Cloud in 1921 he practiced in Turtle Lake, Wisconsin; Rosemount, Minnesota; and South St. Paul. He was born in Montgomery, Minnesota, graduated from St. Thomas College, St. Paul, and from Jefferson Medical School, Philadelphia.

Dr. Schatz was elevated to the Order of the Knights of St. Gregory the Great by Pope Pius XII in Rome in 1952.

He was a member of the Stearns-Benton County Medical Society, the Minnesota State Medical Association, the American Medical Association, the American College of Obstetrics and Gynecology of which he was a founder, the American Committee of Maternal Welfare, the Catholic Physicians Guild, and the American Academy of General Practice.

Dr. Schatz also belonged to American Legion Post 76. He was chief of obstetrics at the St. Cloud hospital for many years.

His survivors include five daughters: Mrs. J. P. O'Keefe, St. Cloud; Mrs. Loretta McNeil, Mountain

View, California; Mrs. John Blommer, St. Cloud; M. Jerry Mackin, Cedar Rapids, Iowa; Mrs. R. C. Seton, Long Beach, California; five sisters: Mrs. Ma Plancisky, Mrs. Edward LeSczen, and Mrs. Carl Fischer Montgomery, Minnesota, Mrs. Elmert Stemper, St. Paul and Mrs. Fred Pomeji, St. Cloud; one brother Stephen Santa Rosa, California, and three grandchildren.

ANDREW SIVERTSEN

Dr. Andrew Sivertsen, Minneapolis urologist for many years, died June 8, 1957. He was seventy-seven years old.

A graduate of Marquette University Medical School, Dr. Sivertsen maintained an office at 522 LaSalle Building for a number of years.

He was a member of the Hennepin County Medical Society, the Minnesota State Medical Association and the American Medical Association.

LUDWIG L. SOGGE

Dr. Ludwig L. Sogge, noted Windom physician for over fifty years, died July 3, 1957. He was seventy-eight years old.

Born in Jackson county, Minnesota, Dr. Sogge attended Red Wing Seminary and received his medical education at the University of Minnesota. After interning at Swedish Hospital in Minneapolis he moved to Windom in 1906. Dr. Sogge purchased the land and was instrumental in building the Windom Hospital; he served as first president of its staff.

Long-active in medical association activities, he was past president of the Minnesota State Medical Association and chairman of the public policy committee for many years.

He was honored by his community, by the state medical association, and by the Southwestern Minnesota Medical Society in 1955 for attaining his fiftieth year in the practice of medicine.

Dr. Sogge was active in the Minnesota Tuberculosis and Health Association and the Cottonwood County Tuberculosis Association. In 1948 he was named Minnesota's outstanding general practitioner. Recently the Windom Good Samaritan Home for the Aged changed its name to the "Sogge Memorial Home" to honor the popular physician.

Dr. Sogge served as mayor of Windom for five years and as Cottonwood county coroner for eighteen years. He belonged to the Methodist Episcopal Church, the Community Club of Windom, the Masonic order and the Odd Fellows. In addition to his county and state medical affiliations, he was a member of the American Medical Association, the Southern Minnesota Medical Association and the Sioux Valley (Iowa) Medical Association.

He is survived by two daughters, Mrs. Alfred Nerdah and Mrs. Elvin Nordby of Windom; three grandchildren one brother, Dr. Tillman Sogge, Northfield; four sisters Mrs. Wilbur Morgan and Mrs. Anton Olson, Minneapolis; Mrs. Morris Bakken, San Diego, and Mrs. Hannah Meium, Jackson. Mrs. Sogge died in February 1957.

IN MEMORIAM

GEORGE E. THOMAS

Dr. George E. Thomas, well-known Minneapolis physician, died June 10, 1957. He was seventy-nine years old.

A native of Berlin, Wisconsin, Dr. Thomas graduated from the University of Minnesota Medical School in 1904. He practiced at Lake Street and Nicollet Avenue in Minneapolis for fifty-one years and was the first doctor to deliver an incubator baby in Minneapolis. He closed his office last December 1.

He served on the faculty of the University of Minnesota Medical School and was chairman of the first cancer committee formed by Dr. William W. Mayo in 1918.

Dr. Thomas was a member of the Hennepin County Medical Society, the Minnesota State Medical Association, the American Medical Association, the American Academy of General Practice, the University Baptist Church, the Ark Masonic Lodge, the Modern Woodmen of America and was a charter member of the Minnesota Alumni Band Association. He was also a member of the staff of Asbury Hospital.

Survivors include his daughter, Mrs. Robert L. Upton, Minneapolis.

URBAN H. ZEE

Dr. Urban H. Zee, Mankato, Minnesota, orthopedic surgeon, died March 28, 1957. He was forty-three years old.

A native of Ethan, South Dakota, Dr. Zee was a

graduate of the University of South Dakota and Creighton University Medical School, Omaha, Neb. He interned at St. Joseph's Hospital in Omaha and took his specialized training at the University of Minnesota Hospitals.

Dr. Zee spent over five years in the United States Army; he was attached to the University of Minnesota hospital unit in Europe and was with the U. S. Army band center at William Beaumont General Hospital. He was in general practice in Texas for four years.

A member of the Blue Earth County Medical Society, Dr. Zee also belonged to the Minnesota State Medical Association and the American Medical Association.

He is survived by his wife, Patricia Ann.

CORRECTION

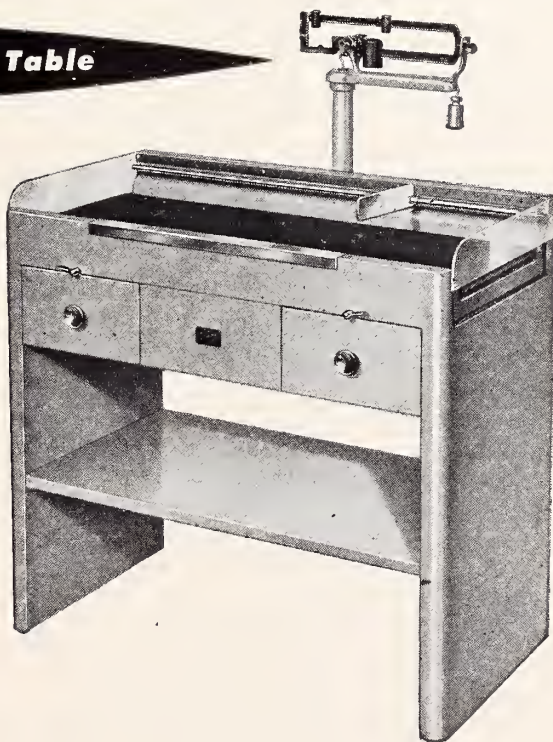
MINNESOTA MEDICINE regrets that because of misinformation, the death of Dr. Henry M. Lee of Cambridge was erroneously reported in the July, 1957, issue. Many apologies to Dr. Lee, his family and friends for this error. Dr. Lee is currently on the staff of the state hospital in Cambridge and a member of the East Central Minnesota Medical Society.

Veterans administration hospitals are safe places for volunteers to work, so far as danger of getting tuberculosis goes. Although tuberculosis afflicts about one out of every 1,000 persons in the general population, a survey of VA hospitals and other installations showed not one of 11,375 volunteer workers developed the disease after coming on duty.—News Item, *Science News Letter*, November 3, 1956.

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SOUTH SAINT PAUL MAN SENTENCED FOR ATTEMPTED ABORTION

On May 15, 1957, Malcolm A. Leitch, forty-one, Route No. 1, South Saint Paul, Minnesota, was sentenced by the Hon. Ronald E. Hachey, Judge of the District Court of Ramsey County to a term of not to exceed two years in the State Prison at Stillwater for the crime of attempted abortion. The defendant had entered a plea of guilty before Judge Hachey on April 24, 1957, to an information charging him with that offense. However, Judge Hachey stayed the execution of the sentence and placed Leitch on probation for a period of two years. After sentencing the defendant, Judge Hachey told him that his crime was a very serious one and he was being placed on probation only because the Court was convinced that the defendant had been misled and would not repeat the offense.

The case involving the defendant came to the attention of the Minnesota State Board of Medical Examiners when a twenty-four-year-old Saint Paul divorcee, the mother of two children, sought medical care at a Saint Paul hospital for her pregnant condition. The patient stated that Leitch had attempted to abort her on four occasions by means of a catheter in an apartment on Dayton Avenue in Saint Paul. According to the woman's signed statement, the person responsible for her pregnancy was the manager of an encyclopedia sales office in Saint Paul. A signed statement was also taken from this man, who admitted that he had arranged for the defendant to perform the abortion and that he had paid Leitch \$70.00 or \$80.00 in cash for his services, in addition to assuming for six months the \$12.00 monthly payments on a \$298.00 set of an encyclopedia for Leitch.

Leitch, who has a large family and lives on a farm near South Saint Paul, holds no license to practice any form of healing in the State of Minnesota. At the time of his arrest, a number of medical instruments were found in the defendant's home, including a speculum, forceps, hemostat, bandage scissors and three catheters. The defendant stated that he graduated from Johnson High School in Saint Paul and that he attended the University of Minnesota for four years but did not complete his course.

TWO UNIVERSITY OF MINNESOTA GRADUATE STUDENTS CHARGED WITH ABORTION

Demetrios Constantine Economou and Dr. Anshumar Antikiel Roy were charged with the crime of abortion in a complaint issued on May 11, 1957, by the Hennepin County Attorney's office and signed by a representative of the Minnesota State Board of Medical Examiners. Economou, twenty-four, a citizen of Greece, was at that time a student in physical chemistry in the Graduate School of the University of Minnesota. Dr. Roy, thirty-three, a citizen of India, who was taking postgraduate work in pediatrics at the University of Minnesota, claimed to be a graduate in medicine from the Ahmadabad Medical School, Ahmadabad, India.

When the defendants appeared before the Hon. Dana Nicholson, Judge of Minneapolis Municipal Court, on May 14, 1957, they denied that the Court had jurisdiction over the case because they were aliens. However, Judge Nicholson did not agree with their contention and bound both defendants over to the District Court of Hennepin County for trial. After the defendants had entered a plea of not guilty before the Hon. John

A. Weeks, Judge of Hennepin County District Court, conferences were held with representatives of the United States Immigration and Naturalization Service, and the cases of both defendants were disposed of in a similar manner.

On May 27, 1957, the defendant Roy appeared again before Judge Weeks, at which time a representative of the Hennepin County Attorney's office made a motion to the Court that the case be stricken from the trial calendar on condition that the defendant leave the United States of America within a period of thirty days and that he emigrate to a country that is non-contiguous to the United States. The Court then ordered that the case be dropped from the trial calendar on those conditions. When the defendant Economou appeared on June 3, 1957, before the Hon. Earl J. Lyons, Judge of the District Court of Hennepin County, a motion was made to the Court that the case be stricken from the trial calendar on condition that the defendant leave the State of Minnesota and complete his two and one-half years of graduate training elsewhere. The Court then granted the motion and ordered the defendant to return to his native country of Greece at the expiration of that period.

The defendants were arrested after the authorities received information that a twenty-two-year-old unmarried Minneapolis woman had undergone a criminal abortion. When the woman was questioned, she alleged that Demetrios Economou had been responsible for her pregnancy and that he had paid the defendant Roy the sum of \$100.00 for performing an abortion upon her. The illegal operation took place in the room where Economou was living while attending the University. The defendant Roy is not licensed to practice medicine in Minnesota, nor does Economou hold a license to practice any form of healing in this state. If either of the defendants violates the order of the Court, the case can be placed back on the trial calendar and the defendant will have to stand trial.

PHYSICIAN'S LICENSE REVOKED

On May 25, 1957, the license to practice medicine held by George F. Engstrom, M.D., fifty-four years of age, Belgrade, Minnesota, was revoked by the Minnesota State Board of Medical Examiners. Dr. Engstrom had been charged in a citation issued by the Board with immoral, dishonorable and unprofessional conduct as defined by law in that he had been convicted of a felony. When he appeared before the Minnesota State Board of Medical Examiners on May 24, Dr. Engstrom admitted the truth of the citation, which further charged that on or about April 22, 1957, Dr. Engstrom had been convicted in the District Court of the United States, State and District of Minnesota, Third Division, of filing and causing to be filed with the Collector of Internal Revenue at St. Paul, Minnesota, a false and fraudulent income tax return for the calendar year 1950.

It was also brought to the attention of the Board that the indictment, to which Dr. Engstrom had pleaded guilty on February 25, 1957, before the Hon. Dennis F. Donovan, Judge of United States District Court, had charged Dr. Engstrom with filing on behalf of himself and his wife, a false and fraudulent income tax return for the calendar year 1950, "wherein it was stated that their net income for said calendar year was the sum

(Continued on Page A-34)

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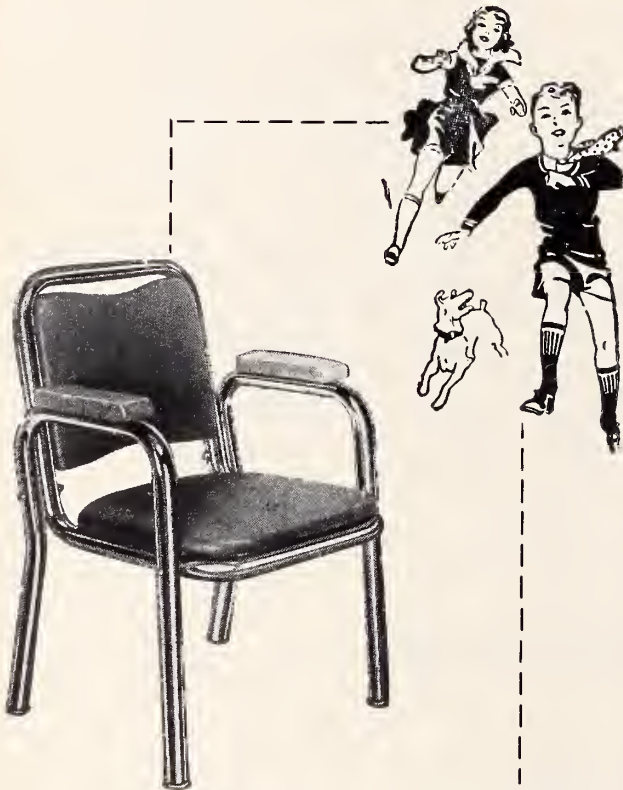
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PHYSICIAN'S LICENSE REVOKED

(Continued from Page A-32)

of \$8,673.50 and that the amount of tax due and owing thereon was the sum of \$909.04, whereas, as he then and there well knew their joint net income for the said calendar year was the sum of \$24,375.47 upon which said net income there was owing to the United States of America an income tax of \$5,040.96 * * *." On April 22, 1957, Judge Donovan sentenced Dr. Engstrom to serve one year in prison and pay a fine of \$7500. However, Judge Donovan suspended that portion of the sentence which provided for the prison term and placed Dr. Engstrom on probation for a period of five years. Dr. Engstrom paid the fine immediately.

Dr. Engstrom's medical license had been previously suspended for a period of three years by the Minnesota State Board of Medical Examiners on February 14, 1953. At that time, he admitted that between January 1949, and June 18, 1952, he had prepared "numerous fictitious, fraudulent and excessive claims for remuneration for professional services * * *." The fictitious, fraudulent and excessive claims made out by Dr. Engstrom were submitted to various insurance companies and other groups covering hospital and medical care benefits. Although the Minnesota State Board of Medical Examiners at that time was of the opinion that Dr. Engstrom's misconduct warranted a permanent revocation of his license, some measure of leniency was extended to him in view of the fact that he had made full and complete restitution to all of the insurance companies involved. In connection with the same matter, Dr. Engstrom had entered a plea of guilty in the District Court of Ramsey County on July 14, 1952, to an information charging him with grand larceny in the second degree. On May 4, 1953, Dr. Engstrom was sentenced for this offense by Judge Arthur A. Stewart to a term of one year in the Ramsey County jail. However, the Court stayed the execution of the sentence for a period of one year upon the defendant's good behavior.

Dr. Engstrom was born in Sweden on April 5, 1903, and received his M.D. degree from the University of Minnesota in March, 1928. He was licensed by examination by the Minnesota State Board of Medical Examiners in July, 1927, upon receiving his Bachelor of Medicine degree. He has been located at Belgrade, Minnesota, since August, 1928.

MINNEAPOLIS MAN SENTENCED TO FOUR-YEAR PRISON TERM FOR ABORTION

On June 13, 1957, Ray G. Erickson, forty-four, 2019 Second Avenue S., Minneapolis, was sentenced by the Hon. John A. Weeks, Judge of the District Court of Hennepin County, to serve a term of not to exceed four years in the State Prison at Stillwater, pursuant to his plea of guilty, which he had entered before Judge Weeks on May 14, to an information charging him with the crime of abortion. In a complaint issued by the Hennepin County Attorney's office, Erickson and the defendant, Bart Setchell, forty-nine, 476 Woodlawn Avenue, Saint Paul, had been charged with committing the offense of abortion on or about May 2, 1957.

When the defendant Setchell was arraigned on the abortion charge in Hennepin County District Court before the Hon. Paul S. Carroll on May 14, he entered a plea of not guilty and the case was set for trial on May 27. When Setchell appeared before Judge Weeks on the latter date, the charge against him was reduced to a gross misdemeanor, practicing healing without a basic science certificate. After Setchell had entered a plea of guilty to the basic science violation, Judge Weeks sentenced him to pay a fine of \$1,000.00, the maximum fine for a gross misdemeanor, and the defendant paid the fine immediately.

The criminal complaint against the defendants, which was signed by a representative of the Minnesota State Board of Medical Examiners, was issued after an investigation disclosed that a thirty-two-year-old Newport, Minnesota, divorcee had been hospitalized at Ancker Hospital in Saint Paul suffering from the after-effects of an abortion. The patient stated that she became pregnant by the defendant Setchell and on May 2, 1957, she received \$300.00 from him to pay for an abortion. The patient then followed instructions and went to a Minneapolis drug store where a man contacted the defendant Erickson, who performed the abortion in his home on that same day by the use of a catheter. The woman said she then paid Erickson \$300.00.

The defendant Erickson stated to Judge Weeks at the time he was sentenced that he was born in Kenyon, Minnesota, on January 2, 1913 and completed two years of high school there. He gave his occupation as being self-employed, living from income property. Although Erickson denied that he had received any compensation for performing the abortion, Judge Weeks told him that he did not believe that he was telling the truth. The defendant Setchell is the president of Setchell-Carlson, Inc., a New Brighton radio and television manufacturing firm. Neither of the defendants hold a license to practice any form of healing in the State of Minnesota.

DOCTORS ADVISE AGAINST LETTING BABIES "CRY IT OUT"

The era of letting babies "cry it out" is over, states a bulletin from the Minnesota State Medical Association. Today doctors advise returning to a more natural and far more sensible attitude in respect to our youngest citizens, that is treating and accepting them as very human beings with justifiable demands to be met and unquestionable needs to be filled. One of the things that disturbs a mother most is what to do when the baby cries. Should she let him "cry it out" or should she pick him up every time he howls?

Basically, the infant cries because it is his only means of communication with the outside world; most of the time the crying means mealtime is overdue. Sometimes it means he is uncomfortable in soiled diapers or feels too warm. Again, and often, the cause of crying is simply unknown. When this happens, the best answer doctors can give is "the more care, the less crying." Studies have shown that babies cry less when they are cared for more. Having his mother around him, being handled and fondled by her not only reduces the baby's need to cry but has strong positive effects on his health and emotional development as well. It is not a good idea to allow a young baby to "cry it out," because the crying is not good for him. It causes disagreeable sensations, perhaps even pains and can end in complete exhaustion.

When the child wails, first check the obvious physical needs; then if all else seems to be in good order, hold him a bit, rock him, sing to him. Let him know how much you love and want him.

It is true that some babies cry more than others. Doctors group them into three general categories: quiet, moderately active, and active. The quiet baby is better able to tolerate stimulation, while the active child with his more acute responses may require more comforting and needs to be held more and given more reassurance.

Some parents fear that the attentions given a crying child may spoil him and may make the attention a habit. This is not so because the baby whose physical needs have been supplied, who has received adequate mothering and love actually requires less and less of such attention as he grows older.

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General Interest

The Great Northern Railway Surgeon's Association met at Glacier Park Hotel, Glacier Park, Montana, June 28-29, for a scientific meeting. **Dr. Burton C. Ford**, Marshall, Minnesota, is president of the group, and **Dr. Ernest R. Anderson**, Minneapolis, is secretary-treasurer.

* * *

Six new physicians have been appointed to the staff of the Mayo Clinic as consultants. **Drs. Shervert H. Frazier, Jr., David B. Robinson**, and **Harry A. Wilmer** will be in the Clinic's psychiatry section; **Dr. George W. Morrow, Jr.**, will be in a section of general medicine; **Dr. Dwight C. McGoon** has been assigned to general surgery; and **Dr. Robert E. Yoss** is in a section of neurology.

* * *

Dr. J. K. Butler attended the Ninth International Congress on Arthritis at Toronto, Ontario, on June 23-28, 1957.

* * *

Dr. and Mrs. Gordon W. Douglas of Pelham Manor, New York, were house guests of **Dr. and Mrs. W. B. Stromme** of Minneapolis during the latter part of June. **Dr. Douglas** is Professor of Obstetrics and Gynecology at Cornell University Medical College, New York, and Chief of Staff at New York Lying-in Hospital.

* * *

Dr. Philip S. Hench of the Mayo Clinic has been relieved of his clinical duties at the clinic so that he may spend his full time writing, working on medical projects, and attending national and international medical meetings. **Dr. Hench** was a 1950 co-winner of the Nobel prize in medicine for his work with cortisone in the treatment of arthritis.

* * *

Dr. Claude F. Dixon, head of a section of general surgery at the Mayo Clinic since 1928, has been granted an early retirement, effective July 1, 1957. He will continue to reside in Rochester.

* * *

The Winona General Hospital medical staff at its annual meeting, June 8, re-elected **Dr. Lewis I. Younger** as chief of staff. **Dr. G. L. Loomis** succeeds **Dr. L. J. Wilson** as secretary of the staff, and all other officers were re-elected. **Dr. C. W. Rogers** is vice president, **Dr. W. O. Finkelnburg**, chief of surgery, **Dr. S. O. Hughes**, chief of medicine, and **Dr. J. A. Tweedy**, chief of obstetrics and gynecology. These men, together with **Dr. Paul Heise**, pathologist, comprise the executive committee.

* * *

Dr. Frederick A. Figi, senior consultant in plastic surgery at the Mayo Clinic, was awarded an honorary doctor of science degree on June 3 by Doane College, Crete, Nebraska, where he took his premedical training.

* * *

Twenty-one Mayo Foundation fellows received their master of science degrees at the University of Minnesota

on June 14. They are as follows: Dermatology and Syphilology, **Drs. Jack E. McCleary** and **William Reed**; Medicine, **Drs. Homer R. Goehrs**, **William Johnson**, **John R. Keyes**, **John W. McKay**, **John Massarelli**, **George W. Morrow**, **Everett N. Rottenberg**, and **John Seshea**; Neurosurgery, **Dr. Raymond R. Straus**; Psychiatry, **Drs. Shervert H. Frazier**, **David B. Robinson**, and **Eleanor Jane Watson**; Radiology, **Drs. Robert Peterson** and **George F. Plum**; Surgery, **Drs. Robert A. Collins**, **Frank G. Gatchell**, **George F. Pratt** and **Meredith P. Smith**; and Urology, **David C. Utz**.

* * *

Dr. Mary C. Ghostley retired on July 1 after for seven years of service in northern Minnesota. After practicing medicine in International Falls for twenty years, she entered tuberculosis work and at the time of her retirement was district medical director for the state health department with headquarters in Bemidji. "Dr. Mary" was honored at a dinner in International Falls, Monday, June 10.

* * *

Dr. Charles W. Mayo, Rochester, was the featured speaker at a convention of the International Association of Health and Accident Underwriters at the Lowry Hotel, St. Paul, June 14.

* * *

The new code of ethics adopted by the American Medical Association at its annual meeting in New York in June was largely the work of **Dr. Louis A. Buie**, emeritus staff member of the Mayo Clinic and Foundation. **Dr. Buie**, chairman since 1952 of the committee working on the revision, has devoted long hours to the project since his retirement from the Clinic and Foundation in late 1955.

* * *

A Mayo Clinic exhibit on the nature and location of pain caused by certain abdominal diseases won the Frank Billings Silver Medal of the American Medical Association at its 106th annual session in New York in early June. The exhibit was the work of **Drs. Lucian A. Smith**, **N. A. Christensen**, **N. O. Hanson**, **D. E. Ralston**, **R. W. P. Achor** and **K. G. Berge**, members of a section of general medicine, and **Dr. Arthur H. Bulbulian**, director of the Mayo Foundation Museum of Hygiene and Medicine.

* * *

Honored with a surprise party at Mounds Park Hospital, St. Paul, was **Dr. Ernest M. Hammes, Sr.**, psychiatrist, for fifty years of service in the medical profession. Employees of the hospital presented him with a cash gift which he donated to the Mounds Park Foundation.

* * *

Dr. Reginald G. Bickford, electro-encephalographer at the Mayo Clinic and associate professor of physiology in the Mayo Foundation, Graduate School, University of Minnesota, attended the International Neurological

ciences Congress in Brussels, Belgium, July 21 to 28. He made the trip under the terms of a travel award granted him by the American Institute of Biological Sciences. Dr. Bickford will present three papers during the week's congress.

* * *

Dr. Hamlin Mattson of Minneapolis spoke before the Wright County Medical Society, July 9, at Annandale, Minnesota, on the subject "Causes and Prevention of Recurrences in Hernia Surgery."

* * *

Dr. W. S. Chalgren, Mankato, addressed the Welcome, Minnesota, Commercial Club recently. His subject was "What A Town Needs to Offer a Doctor."

* * *

Dr. John Moller, a native of Germany, has joined Drs. A. H. Field and Murray Hunter in Farmington.

* * *

Dr. George Pettersen, formerly of Mable, Minnesota, and Dr. Richard Burman have located in the First National Bank Building in Aitkin.

* * *

Dr. Robert F. Gray, Marshall, who has spent three years in Africa, is preparing a written study of his impressions of four African tribes. Dr. Gray has a master's degree in anthropology from the University of Chicago and has made extensive studies of native medicine under Ford Foundation research fellowship.

* * *

Dr. D. G. Pugh, Rochester, has been installed as president of the Minnesota Radiological Society.

* * *

Dr. Harry W. Sargeant has been named administrator of the Memorial Hospital in Long Prairie. He was formerly superintendent of the Milwaukee County Hospital.

* * *

Dr. E. P. K. Fenger, Edina, is the new secretary-treasurer of the American Trudeau Society. He was elected at the 52nd annual meeting of the group held in Kansas City.

* * *

Dr. G. J. Gulseth, a former medical missionary in China and Africa, has joined the staff of the Hendricks Clinic.

* * *

Dr. Neil T. Norris, Caledonia, attended an introductory course in electrocardiography at the University of Minnesota Center for Continuation Study recently.

* * *

Dr. C. F. Reichelderfer has been elected president of the Staples Medical Staff; Dr. Evelyn L. Browe is vice-president and Dr. P. J. Parker, secretary. This group, which was reorganized recently, includes all medical doctors and hospital officials in Staples.

* * *

Dr. J. A. Abullarade, a native of El Salvador, has become associated with Dr. E. P. Donatell in Edina. Dr. Abullarade has practiced in Cokato and at the U. S. Army Hospital, Fort Ord, California.

* * *

Dr. Herman C. Lichstein, University of Minnesota, has received a grant-in-aid of \$2,700 from the National

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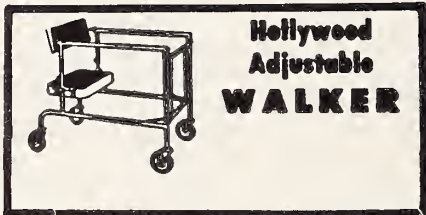
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* * *

Dr. C. Walton Lillehei, University of Minnesota, flew to Europe in June for a three-week lecture tour to Belgium, Sweden, Switzerland and France. His first stop was Brussels where he addressed a conference of the Belgian Medical Association. In Paris he performed several heart operations to demonstrate open heart techniques developed by University of Minnesota surgeons. In Stockholm he spoke before the Scandinavian Surgical Congress which includes surgeons from Denmark, Norway, Finland and Sweden.

* * *

Dr. Curtis M. Johnson has joined the staff of the Winona Clinic. He is associated with Dr. C. W. Rogers in pediatrics. Dr. Johnson was in general practice in Clarkfield for four years and served with the U. S. Army during the Korean War. He took his specialized training at the University of Minnesota.

* * *

Drs. S. K. McHutchinson and Dale Hawk, both former Ohio physicians, have located in St. Charles the new Community Medical Center.

* * *

Dr. F. Wendell Ford, who has practiced in Hemingford, Nebraska, since 1949, has located in New London where he will be associated with Dr. Jack Guy. Dr. Ford is a native of Hutchinson and served with the U. S. Army during World War II.

* * *

Dr. A. N. Bessesen, Jr., Minneapolis, has been named a member of the mayor's advisory committee appointed by the new Minneapolis mayor, P. Kenneth Peterson.

* * *

Dr. O. W. Foster, Minneapolis, has been elected president of the Minnesota Academy of Occupational Medicine and Surgery; Dr. T. E. Barber, Austin, is vice president; Dr. John A. Williams, St. Paul, secretary; Dr. R. W. Goltz, Minneapolis, treasurer; and Dr. B. L. Derauf, St. Paul, research.

* * *

Mrs. Bernie Theissen Elert, a medical technologist at Miller Hospital, St. Paul, has won a \$500 Kimble medical technology research award from the American Society of Medical Technologists.

* * *

Dr. Royden Belcher has left the medical staff of the Oliver Clinic in Graceville to enter private practice in Little Falls.

* * *

Several St. Paul physicians have been named to the staff of Mounds Park Hospital. Dr. E. W. Ostergren is chief of staff; Dr. John Earl, vice chief; Dr. Archibald Leitch, secretary-treasurer, and Dr. Walter P. Gardner and Dr. Vernon Sommerdorf, members of the board of the executive committee.

* * *

Dr. Homer J. Carlson, formerly of Minneapolis, has joined the Korda Clinic in Pelican Rapids.

Dr. D. J. Hanson, formerly of Chaska, has moved to Toledo, Ohio, where he will be associated with the pathology department of Mercy Hospital.

* * *

Dr. Joyce S. Lewis has been named director of the Hamm Memorial Psychiatric Clinic in St. Paul. He succeeds Dr. Clarence J. Rowe who resigned to enter private practice.

* * *

The Upper Mississippi Medical Society held its summer meeting as guests of the Lutheran Hospital staff in Bemidji in June. Speakers included Drs. J. W. Griffin, Bemidji; Mervyn W. Williams, Ah-Gwah-Ching; Leslie Lundsten, Bemidji; William V. Knoll, Brainerd; Harold S. Palmer, Blackduck, and Charles Vandersluis, Bemidji. Drs. Wilford J. Dewese, Bemidji, and G. I. Adeau, Brainerd, presided over the business meeting.

* * *

The following members of the Minnesota State Medical Association received their certificates of fellowship from the American College of Chest Physicians at the annual meeting of the group held in New York City in June: Drs. Ezra V. Bridge, Cannon Falls; Josiah Fuller, Duluth; K. O. Husebye, St. Paul, and Charles M. Nice, Minneapolis. Dr. Sumner S. Cohen, Oak Terrace, was elected governor of the college for Minnesota.

* * *

Mr. Arthur James Gerdes, University of Minnesota, has been awarded a \$500 grant by the American Foundation for Allergic Diseases. The purpose of the award is to expose students to experience in the basic sciences related to allergy and to broaden the application of this knowledge through clinical experience. Mr. Gerdes' work will be under the supervision of Drs. E. B. Brown and Jacob Blumenthal of the departments of physiology and medicine.

* * *

Dr. Maurice B. Visscher, University of Minnesota, spoke at the tenth annual meeting of the Minnesota Heart Association held in St. Paul recently. The Association approved approximately \$200,000 in heart research awards for 1957-58, according to Dr. Robert L. Parker, president.

* * *

Drs. Edward C. Maeder and Wm. E. Taylor announce the association of Dr. Peter Popadiuk in the practice of obstetrics and gynecology at 1051 Medical Arts Building, Minneapolis, and also suburban office in the Miracle Mile, St. Louis Park, Minnesota.

* * *

Dr. Howard P. Rome, head of the section of psychiatry at the Mayo Clinic, and professor of psychiatry in the Mayo Foundation, Graduate School, University of Minnesota, was inducted as president of the Minnesota Psychiatric Association at a recent meeting of that organization in Minneapolis. Dr. Edward M. Litin, a member of the section of psychiatry of the Mayo Clinic, was selected secretary-treasurer of the association. Dr. Dale C. Cameron, clinical professor of psychiatry and neurology in the University of Minnesota, Minneapolis, is vice president and president-elect of the association.

The Minnesota Psychiatric Association, with a membership of 100, is a component organization of the American Psychiatric Association.



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MINNESOTA BLUE SHIELD-BLUE CROSS

Effective July 1, 1957, the Minnesota Blue Shield Board of Directors extended in-hospital medical care or combined surgical and in-hospital medical care benefits from 120 to 180 days for each unrelated illness during twelve consecutive months. This extension of in-hospital medical care benefits is only the latest of a number of improvements and extensions of medical care benefits made by Minnesota Blue Shield in less than ten years of operation, all of which indicate a desire on the part of the Blue Shield Board of Directors to provide a well balanced contract as well as coverage commensurate with improved methods of medical care.

The original Minnesota Blue Shield contract provided benefits for a maximum of twenty-one days of in-hospital medical care for each unrelated illness during twelve consecutive months. The first extension of in-hospital medical care benefits occurred August 1, 1949, when emergency medical care was added to the contract. On October 1, 1952, allowances for the first three days of emergency in-hospital medical care were increased and in-hospital medical care benefits were extended from twenty-one to thirty days.

Again, January 1, 1954, Blue Shield increased allowances for the first two days of regular in-hospital medical care, the first two days of emergency in-hospital medical care, and extended in-hospital medical or combined surgical and in-hospital medical care benefits from thirty to seventy days. At this time consultation benefits were made available to physicians for services on behalf of participant subscribers.

Further improvements in medical care benefits of the Minnesota Blue Shield contract were accomplished July 1, 1955, when intensive hospital medical care was added to the contract. Consultation fees were increased at this time as were Plan B fees for the first thirty days of regular and emergency in-hospital medical care, and benefits for in-hospital medical care or combined surgical and in-hospital medical care were extended from seventy to 120 days for each unrelated illness during twelve consecutive months.

The most recent extension of in-hospital medical care coverage for services rendered on and after July 1, 1957, should be of particular importance in the treatment of cancer, burns, cardiovascular cases and other diseases requiring prolonged care in the hospital.

During the month of May, 1957, Minnesota Blue Cross provided over \$2,500,000 in hospital benefits 18,276 participant subscribers. Days of care provided during May totaled approximately 10,000.

This new high in hospitalization experience represented not only a peak month in dollars, days and case but also in incidence of use of Blue Cross coverage. During May, 1957, 523 contracts out of every 1,000 protected, utilized their Blue Cross benefits. Compared to May, 1956, this was an increase of forty-two cases paid per 1,000 contracts protected.

The increases occurred in the categories of obstetric care and accident cases.

During the first five months of 1957, Blue Cross payments to hospitals totaled \$11,899,357.09, compared to \$9,715,871.80 for the same period of the previous year.

The 85,515 hospital cases paid during this period of 1957, represented 527,764.1 days of hospital care compared to 471,729.3 days of hospital care incurred by 76,139 Blue Cross subscribers during the same period of the previous year.

During the first five months of 1957, incidence rate was 493 cases per 1,000 contracts protected, compared to 471 cases per year. Accident cases were again a major factor in this five-month increase. However, other diagnostic classifications such as obstetrical, respiratory illnesses, neoplasms and nervous diseases also showed an increase over the same period in 1956.

Blue Cross enrollment in Minnesota as of May 31, 1957, totaled 1,114,119 participant subscribers compared to 1,048,607 as of May 31, 1956. The number of effective contracts was 422,519 as of May 31, 1957 compared to 395,999 contracts in effect as of May 31, 1956.

Over-all, the \$2,183,485.29 increase in payments to hospitals for the first five months of 1957, over the same period in 1956 was attributable to: (1) increase in usage, (2) increase in Blue Cross enrollment, and (3) continuing trend to higher benefit level of contracts.

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Book Reviews

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RYPINS' MEDICAL LICENSURE EXAMINATIONS: TOPICAL SUMMARIES AND QUESTIONS.

Walter L. Bierring, M.D., M.A.C.P., M.R.C.P., Ed. (Hon.), with the collaboration of a Review Panel. Ed. 8, 964 pages. Price \$10.00. Philadelphia: J. B. Lippincott Co., ©1957.

Most persons feel the need for review before taking an examination. Medical licensure examinations are no exception. Following Dr. Harold Rypins' original plan to write "separate summaries of each subject and answer questions based on the essential facts contained in each summary," Dr. Bierring has brought out the eighth edition of this book. The contents are divided into the Basic Medical Sciences and the Clinical Sciences.

Although there are several changes from the preceding edition in the panel of reviewers, the text has adhered quite closely to the previous text. However, paragraphs have been added here and there to bring material up to date or to amplify statements where it was felt amplification was needed. Revisions have been made to include some of the newer knowledge, as in enzymology, allergy, antibiotics, tranquilizers, atomic war burn casualties, Salk vaccine. Some subjects, like mastoiditis, which are succumbing to antibiotics and chemotherapy, were omitted; and older concepts, which are being replaced, were left out.

The introductory chapter on examinations has been revised to include a description and examples of the objective multiple-choice written tests as developed by the National Board of Medical Examiners.

Many have found the earlier editions of this book to be a useful outline to have at hand when reviewing for licensure and other examinations, and surely the latest edition will be equally as popular.

M.M.

NEW FILM ON PROFESSIONAL LIABILITY HAZARDS

A new film that shows physicians how to avoid the recurrent headache of medical practice today—the professional liability claim—is now available from the American Medical Association film library for court society and other professional bookings.

Titled "The Doctor Defendant," the new film was premiered this week (June 5) in the New York Cosmos before a large audience of physicians attending the 106th annual meeting of the AMA. The 34-minute black-and-white sound film is the second in the "Medicine and the Law" film series produced by the Wm. Merrell Company, ethical pharmaceutical laboratories, Cincinnati, Ohio, in cooperation with the AMA and the American Bar Association.

The new movie presents in concise and dramatic terms the stories of four doctors who find themselves cast in the disturbing role of "The Doctor Defendant." In reviewing these cases, the film also demonstrates how

county medical society professional liability review committee functions.

Medical societies may now book "The Doctor Defendant" from the AMA film library for showings before their own members. "The Doctor Defendant" is a companion film to "The Medical Witness" which depicts right and wrong methods of presenting medical testimony by re-enacting a personal injury trial. Both films can be booked together as part of a legal medicine seminar.

Produced as a service to the medical and legal professions, "The Doctor Defendant" presents four cases which are among the most frequently encountered and most representative of what the physician has to face.

The first case is that of a physician charged with negligence in causing a burn during x-ray therapy. In another case the doctor is sued because a doctor unthinkingly criticizes the way an orthopedic patient has been treated. In the third, a claim of unnecessary surgery is made, and in the last case a physician is sued when he advises his patient by telephone and an unfortunate result occurs.

All are common situations; however, they are situations about which the physician is generally poorly informed. "The Doctor Defendant" dramatically explains the legal basis on which these suits are brought, and the areas in which the physician is vulnerable. It shows the best methods to avoid involvement and offers concrete advice on how the physician should handle himself once he has been made the target of a professional liability claim.

Special reference is made to the professional liability review committees that have been set up by some of the county medical societies. The film shows one of these committees in action and how it serves the public and the physician member who is in trouble.

Here are seven suggestions for the practicing physician who wishes to avoid liability involvement, as illustrated by "The Doctor Defendant":

1. Explain to the patient the proposed course of therapy and advise him when treatment may be hazardous.
2. Confirm in a letter to the patient the effects of treatment when harmful side actions or results might be expected. Obtain written consent for operative procedures. *Remember to keep a copy for your file.*
3. Review and interpret the clinical significance of all diagnostic or laboratory tests *before* a surgical procedure.
4. A precipitating cause of a large number of professional liability actions is the unthinking comment of physician on treatment given a patient by another physician. All the facts may not be known . . . so avoid tactless comment.
5. Always remember the protective value of a complete case record. It has been shown again and again that the doctor's best defensive tool in a professional liability claim or suit is the detailed case record.
6. All professional liability claims should be reported promptly to the proper persons; this may save time and unnecessary legal involvement.
7. Be constantly aware of the physician's responsibility to the patient. It is the physician alone who must decide the medical care to be provided.

Societies desiring to show "The Doctor Defendant" and/or "The Medical Witness" may write to the Film Library, American Medical Association, 535 No. Dearborn Street, Chicago 10, Illinois, or to Dr. John B. Thewning, director of professional relations, The Wm. C. Merrell Company, Cincinnati 15, Ohio.

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PHYSICIAN NEEDED—In Aurora and Hoyt Lakes, Minnesota, to join group of general practitioners and specialists. Partnership after one year. Contact Dr. R. E. Barnes, Aurora, Minnesota.

WANTED—General practitioner or surgeon to take over practice of doctors removing, for reasons of health, from west central Minnesota town of 2,600, with new modern hospital, and with available clinic building and equipment, and surrounding 20-mile radius area. Address E-572, care MINNESOTA MEDICINE.

WANTED—General practitioner to join busy general practitioner in Northeastern Minnesota. Terms open. Excellent office and hospital facilities available. Address E-589, care MINNESOTA MEDICINE.

EXCELLENT OPPORTUNITY—General practitioner wanted to take over large lucrative practice. Nothing to buy, leaving state permanently. Hospital several blocks from office. Address E-587, care MINNESOTA MEDICINE.

GENERAL PRACTITIONERS—Two capable generalists needed for complete practice—expanding group serving three communities. New clinic facilities, new accredited hospitals. Specialist consultant available in group and expert radiologists and pathologists. Full hospital privileges immediately. Progressive area, finest schools and churches. Good recreational area, hunting and fishing. Salary open. Partnership possible within three years. Contact Mr. James Streitz, Manager, Mesaba Clinic, Hibbing, Minnesota.

ASSISTANT WANTED—Very active general practice in Central Minnesota. New, excellent hospital in town. New clinic building. Good hunting and fishing. Address E-594, care MINNESOTA MEDICINE.

LOCUM TENENS DESIRED. Minnesota licensed physician, final year internal medicine residency, would like to assume family physician's practice August 30 through September 15. Twin Cities or resort area preferred. Address E-597, care MINNESOTA MEDICINE.

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EXCELLENT OPPORTUNITY—General practitioner wanted immediately to take over large practice in southwestern Minnesota town of 1,600. Present physician in practice 40 years, retiring soon, will assist in getting new man established. Large modern clinic building, excellent schools, fine churches. City of 20,000, with two new hospitals and excellent colleges, within 20 minutes' drive. Address E-599, care MINNESOTA MEDICINE.

WANTED—General Practitioner in Minnesota town of 750 in fine farming territory. Excellent office facilities. Now no other doctor in town. Address 1 grade Commercial Club, George Borgerding, President, Belgrade, Minnesota.

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WANTED—General Practitioner for Lamberton, population 1,200, Redwood County, southwestern Minnesota. Practice unopposed; nothing to buy; free use of community-owned general and diagnostic equipment; eight-room, first-floor office; also patients charts and records of large active practice for nine years. Near hospital (new) 15 miles; nearest M.D. 10 miles. Leaving to specialize; will continue practice until replaced. Large modern rambler home available. Contact Dr. Morton Roan or T. E. Kuehl, Lamberton, Minnesota.

WANTED—General Practitioner to take over suburban office in Twin Cities, either as independent or associate. Excellent practice established. Nothing to buy. Write E-601, care MINNESOTA MEDICINE.

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POSITION WANTED—Physician's assistant and secretary with eleven years' experience wants employment in medical office. References available. Address E-596, care MINNESOTA MEDICINE.

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Original Contributions

Experimental Fatty Cirrhosis

F. W. HOFFBAUER, M.D.
Minneapolis, Minnesota

THE RETIRING president of the Minnesota Pathologic Society is permitted to select his own topic for this address. As a physician interested in diseases of the liver, I have chosen one aspect of an inexhaustible subject, cirrhosis. My remarks will be limited to a single form of experimental cirrhosis, namely fatty liver disease in the rat. I should like to describe a classification that we have found useful for grading specimens in the laboratory and in so doing offer some comments on the transition of fatty liver to cirrhosis. No direct correlations with human liver disease is intended nor implied, though some generalizations applicable to the problem of cirrhosis in man may be derived from a study of this disorder in lower animals.

A physician viewing a cirrhotic liver demonstrated to him at the autopsy table realizes that this grossly distorted organ is the end stage of a long continued process. However, it is difficult for him to visualize the manner by which the liver has been converted from a smooth organ of regular texture to such a disorganized structure. A description of the developmental processes in one form of experimental cirrhosis may help somewhat in understanding the transitions that occur in the disorder. In the experimental laboratory one can, by relatively simple means, initiate a process in an animal that will eventuate in cirrhosis. The opportunity is afforded whereby one can observe the sequence of events that takes place.

For many years the basic concepts in the development of cirrhosis have, with much justification, included degeneration, fibrosis and regeneration. The modern concept of this disorder has been concisely stated by Popper.¹ Cirrhosis can be

said to exist when there is "altered reconstruction of the lobular pattern with the formation of regenerative nodules." This concept is accepted by Baggenstoss² and by Karsner.³ Emphasis is put upon reconstruction and particularly upon regeneration. Popper and Schaffner⁴ stress the importance of the intrahepatic vascular anastomoses as well as the regenerative nodules in cirrhosis. The intrahepatic shunts that develop in cirrhosis certainly deserve more adequate consideration than they have received in the past. Very likely they are often unrecognized because they are difficult to detect in microscopic sections.

This presentation will attempt to emphasize the role that *regeneration* plays in the reconstruction of the liver in one form of experimental cirrhosis. This is done in the belief that the aspect of regeneration, while not neglected, has not received the consideration that it deserves. Too much emphasis has been placed on fibrosis. In many descriptions of cirrhosis, the impression is conveyed that fibrosis is an active process, embracing and compressing the liver cells. Actually the fibrous tissue, as it is seen in experimental fatty cirrhosis, appears to represent a condensation of the residual supporting tissue that remained after the parenchymal cells have disintegrated. This supporting frame work, together with the bile ducts, veins, arteries and lymphatics, has been compressed into fibrous membranes by the newly regenerating liver cells.

In order to produce cirrhosis experimentally, widespread death of liver cells is necessary so that excessive regeneration will be forced to occur. One seeks an agent that is capable of destroying some but not all of the parenchymal cells. For this purpose, carbon tetrachloride has been a popular agent. Repeated sublethal doses of carbon tetrachloride cause waves of destruction to sweep over the liver, and a form of cirrhosis develops. In recent years another method of producing experimental cirrhosis has become available. This is

From the Department of Medicine, the Medical School, University of Minnesota.

This investigation was supported by the Research and Development Division, Office of the Surgeon General, Department of the Army, under Contract No. DA-9-007-MD-592.

Presented before the Minnesota Pathological Society, March 20, 1956 at Minneapolis, Minnesota.

a fatty cirrhosis that is the result of a nutritional liver injury. This method offers certain advantages and the disorder that results may bear a relationship to liver disease as it occurs naturally. With information now available, diets deficient in lipotropic factors (choline or its precursor, methionine) can be readily devised. In the rat, a diet deficient in the precursor of choline but adequate in other respects leads to an intensely fatty liver. This situation, if allowed to exist for a period of time, regularly leads to the development of cirrhosis. The investigator has at his disposal a method by which he may follow the sequence of events over a period of weeks or months. The remarkable progress made by many investigators in this field of experimental liver injury has been recently reviewed by Hartroft.^{5,6}

In the course of experiments involving rats maintained for varying lengths of time on diets deficient in choline, the need arose in our laboratory for a system of pathologic classification. The hepatic pathology was not uniform at given intervals even though experimental conditions appeared to be identical. The factor of "time" or *duration* alone did not adequately express the pathologic picture. Descriptions based on the amount of fat or fibrosis present proved unsatisfactory. Therefore, a classification based upon regenerative responses and divided into four stages as described in Table I was devised. This proved to be useful for our purposes and has been employed for the past several years.

Experimental Methods

Rats of a uniform strain* were employed in these studies. Animals were kept in individual cages suspended in racks† in an air conditioned, continuously illuminated room. The relatively wide mesh wire bottoms of the cages permitted fecal pellets to drop out of reach of the animal. This is a matter of some importance in the evaluation of the results in animals fed restricted diets. Because of coprophagia, the rat can ingest a sufficient amount of bacteria or bacterial products to alter the results of long term feeding experiments. The hypolipotropic (choline deficient) diet used in the present experiments contained 8 per cent casein. The composition of this diet, C-8, is given in the accompanying table.

The animals were allowed 8 grams of the diet per day. Ointment jars without tops make satisfactory feeding cups; the feeding mixture is sticky and spillage is minimal. Food was distributed in two or three day allotments three times each week. All uneaten food was discarded on feeding days. Food consumption was not

COMPOSITION OF DIET, C-8

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4. Salts	4.000
5. Cystine625
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Powdered Sugar	996.0625 Gm.
	1000.0000
7. Vitamins A & D plus Tocopherol, in oil: AD Concentrate as: A—200,000 U.S.P. units D— 50,000 U.S.P. units per gram (Ayerst, McKenna and Harrison) Tocopherol (oil) Alpha (G.B.I.) Mixture: 4 parts tocopherol, 1 part AD concentrate, 3 parts peanut oil.	

measured. The feeding mixture was prepared once each week and refrigerated. The three supplemented diets (C-8 A, B and C) contained .05 per cent, 0.2 per cent and 0.4 per cent choline chloride. The choline was added to the C-8 diet and the amount of sucrose correspondingly reduced.

An extensive experience with diet C-8 over a six-year-period in which the same method of preparation, storage and feeding was used indicated that it is definitely hypolipotropic. Severe fatty infiltration of the liver regularly occurs in the rat. Very young male rats usually succumb to hemorrhagic necrosis of the kidneys in fourteen to eighteen days, an indication of the deficiency of this diet in choline. The diet in the amount of 8 grams per day is adequate for growth until the adverse effects of long continued fatty infiltration of the liver become manifest. When the diet is supplemented with choline, the animals remain healthy and growth is adequate considering the restricted nature of this 8 per cent casein diet (45 calories furnished per day). The non-supplemented diet was estimated to furnish approximately 22.4 mg. of methionine and 54 mg. of cystine per day.

In the course of these experiments, specimens were obtained at death, or the animals were sacrificed by anesthetizing with ether and bled by severing the abdominal aorta. The right lateral lobe of the liver was preserved intact in 10 per cent neutral formalin. Longitudinal slices from the left lobe were fixed in neutral formalin or Bouin's fluid, then sectioned and stained with H & E, azo carmine and Oil Red O for histologic studies. Frozen sections were cut 15 microns thick for fat stains.

*Holtzman Rat Co., Madison, Wisconsin.

†Bussey Products Co., Chicago, Illinois.

EXPERIMENTAL FATTY CIRRHOSIS—HOFFBAUER

TABLE I. FATTY LIVER DISEASE IN RATS MAINTAINED ON DIETS THAT PRODUCED VARYING DEGREES OF CHOLINE DEFICIENCY

Number of Rats*	Diet	Supplement	Termination	Stage of Liver Disease at Death or Sacrifice								
				Normal	I	II	IIIA	IIIB	IVA	IVB	IVC	†
42	C-8	None	Died	—	11	2	1	1	2	17	7	—
64	C-8	"	Sacrificed	—	12	11	13	11	10	3	4	—
17	C-8A	Choline	"	—	6	—	3	3	3	—	—	2
17	C-8B	"	"	11	6	—	—	—	—	—	—	—
22	C-8C	"	"	2	20	—	—	—	—	—	—	—

*Holtzman Strain—Males, body weight 100-125 gm. at start of experimental period.
†Unclassified

Diet C-8A—.05% Choline added to C-8 Diet
" C-8B—.2% " " " " "
" C-8C—.4% " " " " "

Experimental Results

The classification utilized in present report is based upon the gross and microscopic features of the livers from 106 rats maintained on a choline-deficient diet (Diet C-8) and from fifty-six rats maintained on the same diet supplemented with choline. The data shown in Table I and in Figure 1 indicate the stages of fatty liver disease reached when the animals died or were sacrificed.

In fatty liver disease in the rat, the resultant liver pathology demonstrable at any given time is determined by the prevailing experimental conditions. For instance, if the experiment is begun with young rapidly growing animals, the various stages are attained earlier than when one commences with older animals. Female rats appear to tolerate choline deficiency better than do males. Furthermore, the character of the diet influences the degree of fat accumulation and consequently the rate of cell destruction.

The gross appearance of the liver in various stages of the development of fatty cirrhosis in the rat is shown in Figure 8. The right lateral lobe of the liver, after formalin fixation, has been employed for these illustrations. The liver is transformed from an organ of uniform texture and smooth surface to a completely irregular nodular structure. In the process it passes through a phase of uniform and equal enlargement of individual areas that results for a time in a hyperplastic liver. A description of the sequence of events in the development of experimental fatty cirrhosis has been illustrated in a series of diagrams shown in Figure 2. The figures are entirely schematic; on microscopic examination one could never see such an arrangement. No section of liver tissue ever contains nine central veins and twelve terminal portal veins in one microscopic field. One of the greatest handicaps to the understanding of the structural changes that occur in cirrhosis is

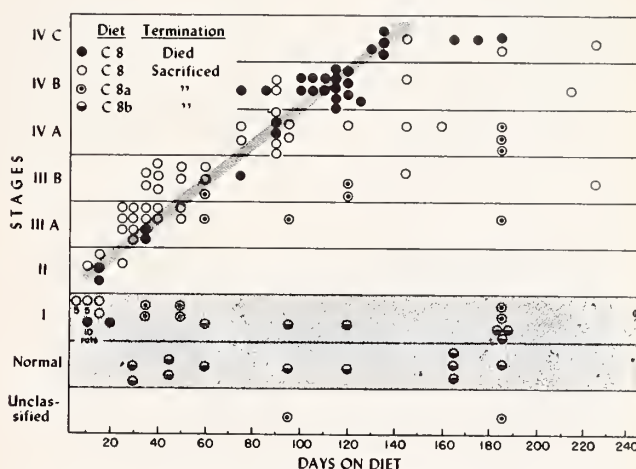


Fig. 1. Time relationship between stages of fatty liver disease attained and the degree of choline deficiency.

The diet, C-8, fed to 106 rats, resulted in severe fatty liver disease. As indicated by the arrow, the time relationship is roughly linear. Seventeen rats received diet C-8 B, i.e., the experimental diet supplemented with 0.2 per cent choline. In this group of animals, sacrificed at intervals up to 184 days, six showed only centrilobular fat (Stage I), and eleven exhibited no histologically demonstrable fat in the liver. Among the seventeen rats maintained on the diet C-8 A (.05 per cent choline supplement), six remained at Stage I. The remainder attained variable degrees of cirrhosis but always less pronounced than in animals severely deficient in choline.

the necessity of examining liver specimens in only two dimensions i. e., a thin slice of tissue viewed under the microscope. The organ has three dimensions and the pathologic changes are three dimensional, a fact well appreciated and beautifully illustrated in the recent studies of Popper and Elias⁷ and Kelty, Baggenstoss and Butt.⁸ Realizing the limitations of an oversimplified two-dimensional approach to a three-dimensional problem, the series of drawings in Figure 2 represent an attempt to portray, in terms of "stages," the changes that occur in the liver of rats as a result of continuous severe accumulation of fat.

Stage I. Centrilobular Fat.—The first histologic evidence of choline deficiency in the rat is the ac-

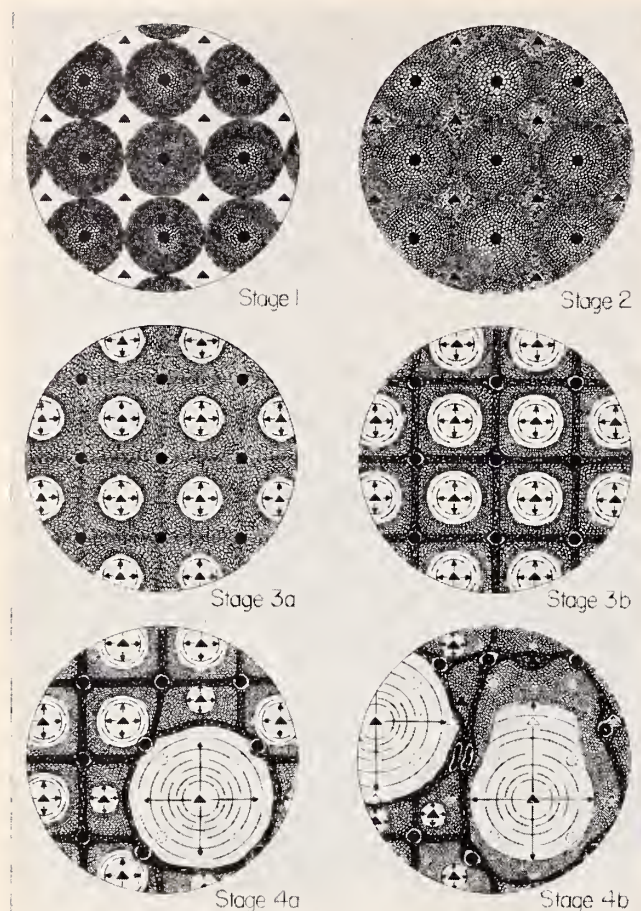


Fig. 2. Schematic representation of the four stages of fatty liver disease in rats maintained on diets severely deficient in choline.

The small black circles represent central veins. The small black triangles represent *terminal* branches of the portal vein and not the large or conducting branches. Bile ducts and hepatic artery branches are not presented in the diagrams. The accumulation of intracellular fat in the liver is represented by the stippled areas. The formation of fatty cysts is depicted by the minute open circles. The white areas indicate non-fatty cells, i.e., areas in which fat accumulation has not yet occurred (Stage 1) or newly formed (actively regenerating) cells that have not yet become fatty (Stage 3a). The new formation of liver cells and the pressures exerted by this regenerative activity are indicated by the crossed arrows. The trabecular pattern produced by the membranous septa that course from central vein to central vein is determined by the pressure produced by areas of regeneration, uniform in Stage 3, irregular in Stage 4. The regenerative nodule is depicted in the diagrams in Stage 4 A and 4 B.

cumulation of fat droplets in the cells adjacent to the central veins. Stage I has been designated as that in which one-half of the cells of the liver lobule are laden with fat droplets, as shown in Figures 2 and 3. In *severe* choline deficiency, there is no abrupt cessation of fat deposition in the liver, as the term "stage" might suggest. However, when minimal amounts of choline are added to

the diet, the degree of fatty infiltration may not progress beyond this stage. As can be seen from the data in Table I and in Figure 1, animals that received supplements of choline in amounts of 0.2 or 0.4 per cent (Diets C-8 A and C-8 B), either showed no fat in the liver or the accumulated fat remained confined to the centrilobular area. This was true even though some animals were continued on the supplemented diet as long as 180 days before sacrifice. There were no other pathologic changes in the livers of these animals. A moderate degree of fat accumulation limited to the central vein area may exist in the liver for prolonged periods without producing any structural alteration. To produce structural changes in the liver, hepatic steatosis must be severe. Fat must accumulate in liver cells to such an extent that the cells are actually ruptured by the large droplets. The classic studies of Hartroft^{9,10,11} have clearly demonstrated this. Failure to appreciate this aspect no doubt has led to some confusion regarding the role that fat plays in the production of experimental cirrhosis.

Stage II. Entire Liver Fatty.—Severe choline deficiency in the rat leads quickly to a state in which the entire liver lobule becomes fatty (Figs. 2 and 4). This has been designated Stage II. Now every liver cell contains fat and those adjacent to the central veins have become so distended with fat droplets that they have ruptured and formed, by fusion with adjacent ruptured cells, fatty cysts.

The formation of fatty cysts, so clearly described by Hartroft^{9,10,11} is a basic and fundamental mechanism by which liver cells in the choline-deficient rat are destroyed or at least rendered useless as functioning cells. There can be no doubt of the existence of fatty cysts. They can be visualized by inspection of unstained fresh or formalin fixed fatty liver specimens under the dissecting microscope. It is obvious from their size that their walls are composed of the remnants of many liver cells. When they have formed in abundance, the liver has obviously been deprived of a large number of functioning cells.

Stage II in fatty liver disease may be regarded as a critical one for the life of the animal. The well known enormous functional reserve of the liver has now been greatly reduced and the animal is in a hazardous state. Nature has, in effect,



Fig. 3. (*Upper left*) Photomicrograph (H & E, low power) Stage I of fatty liver disease in the rat. The accumulation of intracellular fat is limited to the areas about the central veins. The areas about the portal veins and particularly the terminal branches of this venous system have, as yet, been spared.

Fig. 5. (*Lower left*) Photomicrograph (H & E, low power) Stage III A of fatty liver disease in the rat. Newly formed and therefore non-fatty cells are beginning to appear about the areas nourished by the terminal branches of the portal vein. Pressures will be exerted by each of these areas of active regeneration. The fatty cysts link central vein to central vein.

performed a partial hepatectomy in the sense that the rat has been deprived of a great deal of his functioning liver tissue. The response to this situation is active regeneration—the formation of new liver cells. In order to appreciate fully the remarkable regenerative ability of the liver, one needs but consider the effects of a partial hepatectomy in the normal animal. The surgical removal of two-thirds of the liver in the normal rat is followed by a dramatic regeneration of liver cells in all parts of the remaining liver lobules. The result is that in a few days each lobule of the residual liver lobes has increased in size; even-

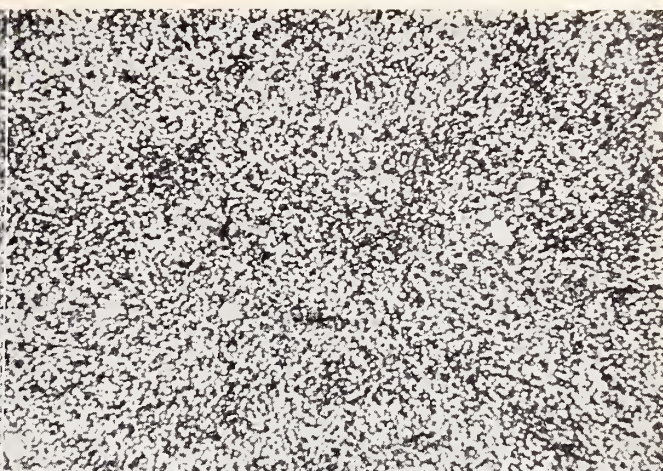


Fig. 4. (*Upper right*) Photomicrograph (H & E, low power) Stage II of fatty liver disease in the rat. The accumulation of fat involves the entire liver lobule. Fatty cysts (scarcely discernible at this magnification) are beginning to form in the areas about the central veins. The areas about the terminal portal veins are difficult to recognize. All the parenchymal cells contain fat droplets.

Fig. 6. (*Lower right*) Photomicrograph (H & E, low power) Stage III B of fatty liver disease in the rat. Trabeculae link central veins and large conducting portal veins. The location of these fibrous strands (membranous septa cut on edge) is determined by the pressures and counter pressures exerted by the myriads of areas of liver cell regeneration each centered about the terminal branches of the portal veins.

tually the animal has a liver that weighs as much as the original one and functions normally. In that situation, the portion of the liver that has been left behind after extirpation of two-thirds is normal in structure. It regenerates uniformly. The situation in the rat with extensive fatty infiltration is quite different. The original structure still remains although the number of functioning units is greatly reduced. The stimulus to regenerate—in all probability a humoral mechanism exists that dictates to the liver that it must create more cells—is operative. Regeneration will be maximal in the areas that are the least fatty and

presumably the best nourished. These are the areas about the terminal branches of the portal veins, a fact appreciated by Ashburn, Endicott, Daft and Lillie¹² in 1947 and clearly demon-

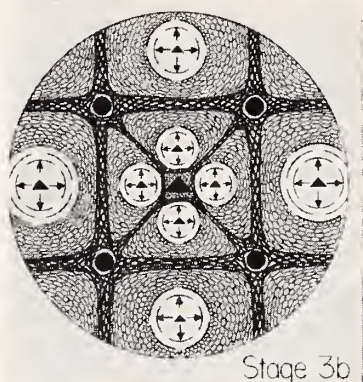


Fig. 7. Diagrammatic representation of the mode of incorporation of areas about the larger or conducting branches of portal vein membranous septa.

In Stage III B, trabeculae not only link central vein to central vein areas but also the areas about the larger or conducting portal veins. The large black triangle in the center of this figure denotes a conducting portal vein (bile duct and artery omitted). The black circles denote central veins. The small triangles denote terminal branches of the portal vein (as in Figure 2). Forces exerted by areas of regeneration (depicted by arrows) could be responsible for the patterns assumed by the membranous septae (trabeculae) that are seen in experimental fatty cirrhosis in the rat.

strated more recently by Hartroft¹³. This area receives fresh blood first; for this reason and probably others, it constitutes the area best suited to take part in active regeneration. In severe choline deficiency, the sequence of events can be depicted as a prompt passage through Stage II, a stage in which the entire liver is fatty, into a third phase, Stage III, in which regeneration becomes a prominent feature. Actually, regeneration does commence before every cell in the liver lobule is involved by fat accumulation. The process of fatty liver disease in the rat is a dynamic one. The destructive forces, cellular disruption and the response, regeneration, go on simultaneously. For descriptive purposes it is convenient to consider the sequence of events as if they occurred in stages.

Stage III. Uniform Periportal Regeneration.—Stage III may be divided into an early aspect in which fibrosis is not yet apparent (III A) and a late and more prolonged aspect in which fibrosis is a prominent and conspicuous feature (III B). In the present description, emphasis is placed upon regenerative activity on the part of the cells

about the terminal branches of the portal vein. The formation of fatty cysts in the centrolobular areas has preceded active regeneration.

In Figure 2, the white circular areas with the crossed arrows (Stage III A) indicate regeneration occurring uniformly about each of the terminal portal veins. As this process continues, pressures will be exerted and the disintegrating fatty cysts about the central veins will be compressed. Figure 5 illustrates this regenerative activity about the terminal branches of the portal veins. It is difficult to depict this in a convincing manner in a single photomicrograph. Terminal portal vein areas are seldom found on the same plane as central vein areas in sections cut at 5 micra. Frozen sections cut at 15 micra reveal this phenomenon better, for the newly formed non-fatty cells stand out as "islands" in the intensely fatty liver.*

One of the characteristic microscopic features of early cirrhosis in the choline-deficient rat is the appearance of fibrous septa that link central vein to central vein. This nonportal trabeculation was demonstrated in the studies of Ashburn et al in 1947¹² and further elaborated upon by Hartroft in 1954¹³. The fact that the small terminal portal vein together with its accompanying bile duct, is not incorporated in the fibrotic trabeculae has been clearly demonstrated. The diagrams of Stages III A and III B in Figure 2 indicate regenerative activity predominating in certain areas. The resulting pressure from the expansion of these areas will determine the *pattern* of "fibrosis" in the liver as cirrhosis develops. The trabeculae that extend from one central vein to another appear in microscopic sections as strands or bands

* The mere absence of visible fat droplets in the cells of the periportal area of a given section of liver does not constitute unequivocal proof that these cells are newly formed. In the rat maintained on these choline-deficient diets, fat can be mobilized from liver cells very rapidly by modifying the experimental procedures. For example, the addition of even minute amounts of a lipotropic agent will, in a matter of twenty-four to thirty-six hours, mobilize fat from the liver. The first cells to give up the fat are those about the periportal areas. If an animal that has been fed a choline-deficient diet long enough to produce an intensely fatty liver is suddenly starved for thirty-six to forty-eight hours, some fat will leave the liver. Again, it is the periportal areas that will release the fat droplets. Unless the experimental conditions are known, it is difficult to interpret the significance of fat free cells in the periportal areas. The specimen used for the illustration in Figure 5 was obtained from an animal in which the food consumption prior to sacrifice was measured. It was found that the rat was eating the deficient (C-8) diet. Therefore, neither starvation nor the addition of a lipotropic agent was a factor in this instance.

(Fig. 6); in reality, they are sheets or membranes of compressed tissue. They represent the remnants of the disintegrating fatty cysts plus the original supporting structures. The sinusoids and the bile

that might account for this. The incorporation of vascular channels into membranous septa is of the utmost importance. By this means, shunts between portal vein and central vein and shunts from the

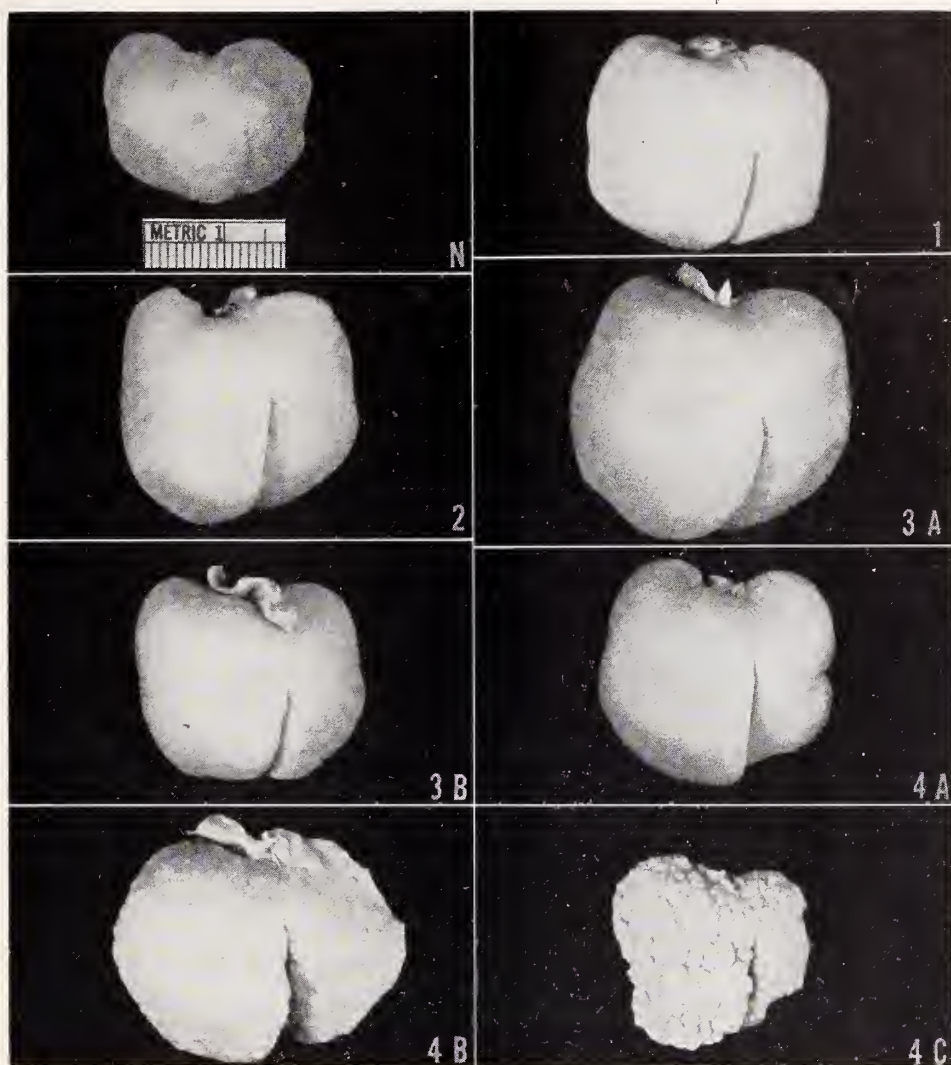


Fig. 8. The gross appearance of the liver of the rat in the various stages of fatty liver disease. The right lateral lobe of the liver, after fixation in formalin is shown in the photographs. All photographs were taken at the same magnification. As fat accumulates in the liver, enlargement occurs. Active liver cell regeneration, initially uniform throughout the liver, is an additional factor in the enlargement (Stage 3 A). In Stage 4 A the appearance of regenerative nodules is just discernible as small protruberances on the surface. Thereafter (Stages 4B and 4C) they become the dominant and conspicuous feature. The final phase is an atrophic nodular cirrhosis.

capillaries that remain are incorporated into these membranous structures by pressure. As the fat filled cysts collapse, the fat leaves either by entry into the vascular system or into the bile duct system¹⁰. The fibrous trabeculae become complex as more and more tissue is compressed into them. The larger or conducting portal veins together with their arteries and bile ducts also become included in the membranous trabeculae. Figure 7 demonstrates in a schematic fashion a mechanism

hepatic artery to the portal vein, or to the central vein can occur.

The changes in the gross appearance of the liver in Stage III is shown in Figure 8. Because there is uniform regeneration that involves each and every lobule, the gross appearance of the liver in stage III bears a close resemblance to the actively regenerating liver remnant that can be observed after a partial hepatectomy has been performed in a normal rat. In the case of the

fatty liver, each lobule already distended by fat filled cells is further increased in size by the addition of newly formed cells.

As long as the liver remains at stage III, the animal appears to remain in a satisfactory state. Uniform and regular regeneration proceeding in each and every periportal area seems to permit the liver to function adequately. Cellular disruption and new cell formation appear to be "in balance." The animal gains in body weight. Ascites or pleural effusion, common in the late stages of cirrhosis in the rat, is not seen while the liver remains at Stage III. Anemia is not a feature at this stage. Icterus is often present, as judged by the presence of bilirubin in the urine and the yellow color of the blood serum (normal rat serum is colorless). The male rat appears quite healthy despite the presence of the hypertrophic fatty cirrhosis that characterizes Stage III B. As is apparent from Figure 1, few rats died during this stage. Occasionally a rat, sacrificed as late as 225 days after the start of the experiment, exhibited no further progression of the cirrhotic process than Stage III B. This could be explained, in part at least, by coprophagia. The minute amounts of choline or precursor present in the ingested feces may furnish just enough protection to slow down but not prevent the usual sequence of events as regards cirrhosis development. The same phenomenon was observed where suboptimal amounts of choline (Diet C-8A, .05 per cent supplement) was added to the diet. This did not always prevent fat accumulation in the liver but it did retard the process considerably (Fig. 1).

Stage IV. Irregular Periportal Regeneration.—The final stage in the development of fatty cirrhosis in the rat is reached when the liver becomes nodular. The formation of regenerative nodules represents the striking and distinguishing feature of experimental cirrhosis. As this stage is reached, a few small irregularities appear on the surface of the liver (Stage IV A, Figure 8). During Stage III the surface has had a uniform appearance, a lobular pattern marked off by slight and regular pitting. The slight pit or indentation on the surface of the rat liver represents a central vein that drains the surface cells and the thin capsule. As the transition to Stage IV occurs, certain areas gradually enlarge and project further from the surface. This process is not limited to the surface

but is occurring in a haphazard fashion in all parts of the liver. This is the beginning of nodular regeneration. No longer do the newly formed cells grow in orderly or uniform fashion along predictable planes. This change in the regenerative process is shown in Figure 2 (Stage IV A). The growth of the mass of cells constituting a regenerative nodule is only partially restrained. By expansion they distort the structure of the liver pushing veins, arteries and bile ducts in various directions. Why does this occur? What mechanism operates that stimulates or permits one area of the liver to grow, seemingly at the expense of other areas? Is this focal hyperplasia due to some mechanism that induces local growth? Or do the adjacent lobules fail to grow thus allowing a dominant area to expand? Unfortunately, no satisfactory answers are available for these questions.

For purposes of classification, Stage IV has been subdivided into three phases. In Stage IV A, regenerative nodules are just discernible on gross inspection or on microscopic examination. In Stage IV B approximately one-half of the liver is made up of such nodules. Eventually, the entire liver appears to be composed of regenerative nodules; all of the original tissue is compressed between them. Cirrhosis formation may then be regarded as complete and has been designated as Stage IV C. The gross appearance (Figure 8), indicates that there is a decrease in the size of the liver in the late stages, i.e., an evolution from a hypertrophic fatty cirrhosis to an atrophic nodular cirrhosis.

The growth curves of rats that were followed throughout the natural course of this fatty liver disease indicated that a loss of body weight occurred at about the time the pattern in the liver changed from Stage III to Stage IV. The deleterious effects of the cirrhotic disorder in the rat seem somehow to be associated with the presence of regenerative nodules. In the present experiments the animals passed into stage IV between seventy-five and ninety days. The loss in weight reflected a decreased food intake as the disorder progressed. In Stage IV B and IV C pleural and peritoneal effusions, anemia and, in the males, a loss of body hair often occur. Rats do not survive long after ascites makes its appearance. They do not develop esophageal varices.

Very little is known about the origin, the struc-



Fig. 9.

Fig. 9. (*upper left*) Photomicrograph (H & E, low power) Stage IV A of fatty liver disease in the rat. In the center of the field, one of the areas of periportal regeneration is larger than the others and can be regarded as a "regenerative nodule."

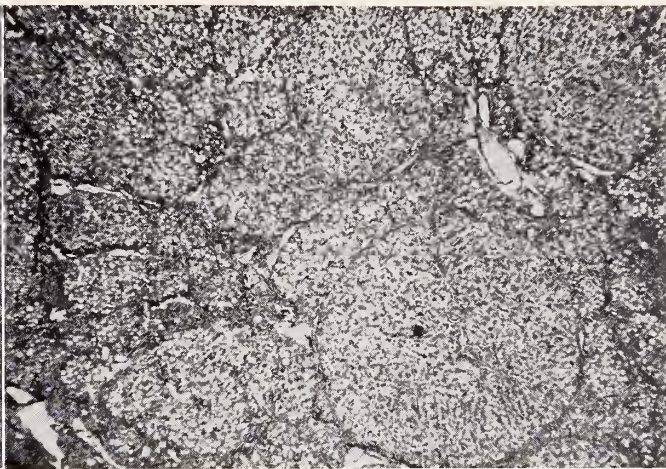


Fig. 10.

Fig. 10. (*upper right*) Photomicrograph (H & E, low power) Stage IV B of fatty liver disease in the rat. Three nodules (areas of irregular periportal regeneration) are seen in the right hand side of the field. Adjacent periportal areas have not kept pace with these and are being compressed by the expansion of the nodules.

Fig. 11. (*lower right*) Photomicrograph (H & E, low power) Stage IV C of fatty liver disease in the rat. Portions of three large and several smaller nodules are shown. The original structure of the liver has been grossly distorted by the expanding nodules. The vascular components (central veins, conducting branches of the portal and hepatic veins, and hepatic artery branches) as well as the bile ducts are all compressed into the trabeculae.



Fig. 11.

ture and the functional capacity of the regenerative nodule that develops in fatty cirrhosis in the rat. Available evidence indicates that these nodules represent *irregular* periportal regeneration. The main source of blood supply appears to be the terminal branches of the portal vein. Preliminary studies bearing on this question have been made in our laboratory. Colored substances injected into the portal vein do penetrate the nodules but appear to do so with difficulty. The portal vein terminal does not uniformly occupy the center of the nodule as Figure 2 indicates. The vessel and its newly formed branches often appear to be eccentrically placed within the nodule. One must assume that the small portal vein lengthens and branches out in order to extend along with the expanding mass of cells. Regenerative nodules are comparatively large, occasionally up to 2 mm. in diameter. In such structures, several vessels of fair caliber may be seen within the substance of the nodule. When several separate vessels are seen in the transverse section of a nodule, they are

thought to represent branches of the original vessel, the latter being located at a level below the plane of the tissue cut. Further evidence that the blood supply of the regenerative nodule in these animals is predominately portal in origin is suggested by the location of injury produced by carbon tetrachloride when this is administered to rats with fatty cirrhosis¹⁴.

It is difficult to assess the contribution of hepatic arterial twigs to the regenerative nodule, for the artery is very minute in the rat and it is hard to follow the course of its branches. Although attempts have been made to trace the artery by injecting India ink, ink in gelatin and colored latex solutions in varying concentrations, adequate specimens have not been obtained. Injection studies of the hepatic vein system demonstrate clearly the effect of the regenerative nodules on these vessels. The central veins are always at the periphery of the nodules; they are incorporated in the trabeculae. The hepatic veins are flattened and compressed by the expanding regenerative

nodules in experimental cirrhosis in exactly the fashion that have been so clearly demonstrated in human cirrhosis^{7, 8}.

The biliary drainage system from the regenerative nodules is presumably by way of small ductules within the mass of cells. They are visible adjacent to the portal vessels and also as separate structures. The latter are comparable to the never-ending branching intralobular bile ductules or cholangioles seen in normal liver tissue. Biliary drainage may also occur directly through the periphery by a junction of bile capillaries to cholangioles in the fibrous walls about the nodules.

The regenerative nodule in experimental fatty cirrhosis appears to be composed of cells arranged irregularly. They are usually in the form of two-cell thick plates, although at times the original single cell plate form appears to be maintained. Hartroft has emphasized that the cells of the nodules are less fatty than their predecessors, the original liver cells. In general this is true. In our own material we have seen many instances in which the cells of the regenerative nodules do become filled with fat. In many instances fatty cysts form inside the nodule. This has been depicted in Figure 2 (Stage IV B). The collapse of peripheral intranodular cysts adds to the thickness of the trabeculae and may also contribute to septa forming within the confines of a nodule. Where several focal areas of regeneration develop in a nodule they may compress disintegrating cysts between them. The division of an original nodule by septum formation increases the complexity of the microscopic appearance. In short, one witnesses a miniature form of cirrhosis occurring within the nodules of a cirrhotic liver. Unequal regeneration or forces of expansion may cause "breaklines" or rifts within the nodule that subsequently become membranous. This explanation has been offered by Popper and Elias⁷ for the septal formation in human cirrhosis, and indicates how the liver lobule may be subdivided. It has not been thought necessary to invoke this explanation for the septa that are found in rat liver in Stage III where uniform periportal regeneration predominates. However, such an event might occur in Stage IV within the confines of the regenerative nodule. An additional factor that may add to the complexity of the late stages of experimental fatty cirrhosis is the necrosis of an entire regenerative nodule. This has been occasionally seen in liver biopsies taken during Stage IV. A

nodule may for some obscure reason become infarcted and undergo disintegration. The result will be collapse and approximation of the structures that surrounded the original nodule. Had the biopsy been secured a few days later, a "scarred area" represented only as a thicker trabeculation would have been seen. Interpretation would have been most difficult. Although this type of disintegration of nodules is rare, this can serve to emphasize some of the difficulties in interpreting the sequence of events in cirrhosis if one is limited only to autopsy material as is the case in the study of human pathology.

As individual nodules continue to grow in a seemingly unrestrained fashion, they dominate the picture in experimental cirrhosis. The original liver structure between them undergoes more and more pressure and the parenchymal cells that were initially growing in a number of periportal areas tend to disappear. The consequence is thicker and thicker trabeculae, although, in the rat, the trabeculae never become extremely thick because the capsule and the supporting framework derived from the capsule of the liver is not very substantial. It would be of interest to correlate the "fibrosis" of experimental cirrhosis in various laboratory animals to the original content of the supporting framework of the liver. In the mouse, for example, the studies of Buckley and Hartroft¹⁵ as well as those of Meader¹⁶ indicate that "cirrhosis" is not readily produced by choline deficiency. There is little or no fibrosis, although extensive fatty livers develop.

Discussion

The available information regarding nutritional requirements is now so complete that one can devise and feed laboratory animals diets deficient in various essential ingredients and thus produce certain pathologic disorders with a predictable regularity. The deliberate production of fatty liver disease in the rat by such a mechanism has been the basis for the experimental studies described in this paper. A diet deficient in methionine as a result of limiting the protein intake produces a lack of available choline. In the rat, the absence of an adequate supply of choline permits the accumulation of fat in the liver cell in pathologic amounts. This increasing accumulation of fat in the parenchymal cells leads to their destruction by cell rupture and subsequent fatty cyst formation as demonstrated by Hartroft. As a con-

sequence there is a gradual but continuous reduction in the number of functioning liver cells. One of the fundamental characteristics of the liver is the ability to regenerate in response to a decrease in the number of functioning cells. Thus the choline-deficient state fulfills very nicely the prerequisite for the study of experimental cirrhosis, —i.e., liver cells are destroyed in a slow and predictable fashion while the capacity of the liver to form new cells remains intact. The events that occur in the development of cirrhosis can be conveniently witnessed by sacrificing animals at intervals and studying the pathological changes.

The classification that we have adopted in the laboratory for grading liver specimens has been employed in this report as a background for a description of the development of cirrhosis in the course of the fatty liver disorder in the rat. As the disorder progresses, the pathologic changes at any given time are not necessarily uniform from one animal to another. An anatomic or histologic basis for a classification was necessary. It has been found useful to describe the changes in terms of "stages," and to recognize four such divisions. The response of the liver, i.e., cellular regeneration, forms the main basis for the classification that has been employed.

The transition of fatty liver to cirrhosis is dynamic, and continuous changes are occurring. Although there are no abrupt transitions, as the term stage might imply, recognizable changes do develop and persist. Thus certain histologic criteria are characteristic in each of the four stages. Stage I is recognized by the presence of fat limited to the centrilobular areas. In severe choline deficiency this stage is so transitory as to be of little importance. However, when minimal amounts of choline are present in the diet, the features of Stage I may constitute the only histologic evidence that the supply of this substance is suboptimal. Under such conditions the liver may remain in this stage for months. The continued presence of *small* amounts of fat in the liver does not lead to structural changes. However, when the deficiency of choline is severe, the liver cells quickly become filled with fat; a stage is reached in which every parenchymal cell is involved. This has been termed Stage II. It is also a very transitory stage. The immediate response to such a situation—one in which the total mass of *functioning* liver cells is reduced—is the formation of new cells. Thus the liver quickly passes into a third and more pro-

TABLE II. STAGES IN FATTY LIVER DISEASE IN THE RAT IN SEVERE CHOLINE DEFICIENCY

I Centrilobular Fat	3-10 days*
II Entire Liver Fatty	10-15 days
III Uniform Periportal Regeneration	
A. Fibrosis Absent	15-30 days
B. Fibrosis Present (hypertrophic fatty cirrhosis)	30-75 days
IV Irregular Periportal Regeneration	
A. Regenerative Nodules (just detectable)	75-90 days
B. Regenerative Nodules (involve one half of liver)	90-120 days
C. Regenerative Nodules (involve entire liver)—(atrophic fatty cirrhosis)	120-180 days

*Time periods are applicable only to the conditions of the present study; the character of the diet, the sex and strain of rat and the age of the animal when the hypolipotropic diet is started, all influence the rate of progress.

tracted phase in which cellular regeneration is a prominent feature.

Stage III is characterized by uniform regeneration in the periportal areas of the liver. The areas about the *terminal* portal veins represent unique features in the rat as demonstrated by the studies of Hartroft. An early aspect of Stage III is the occurrence of regeneration before fibrous trabeculae are visible in microscopic sections (Stage III A). Very soon, however, the disintegrating fatty cysts and the adjacent supporting structures are compressed into fibrous trabeculae that link central veins and conducting portal veins. This compression of tissues produced by the forces exerted by myriads of areas of active liver cell regeneration about periportal areas determines the pattern of the fibrous trabeculae that characterizes Stage III B, a hypertrophic fatty cirrhosis.

The final phase in the transition of the fatty liver to cirrhosis is reached when *uniform* periportal regeneration changes to *irregular* periportal regeneration (Stage IV A). This is recognized by the appearance of the "regenerative nodule" which is believed to be the characteristic morphologic feature of irregular periportal regeneration. The full development of experimental cirrhosis is attained when the regenerative nodules completely dominate the gross and microscopic picture. By their expansion, the nodules compress all of the original liver tissue into membranes of varying thickness and composition. Ultimately, the liver is reduced to an atrophic nodular cirrhosis. The site of origin and the subsequent growth of the regenerative nodule is believed to be the most distinctive and important feature in the development in this form of experimental cirrhosis. Unfortunately, there is as yet very little

information concerning the fundamental nature of this phenomenon.

No direct application of a study of fatty cirrhosis in an animal may be made to the problem of human cirrhosis. The present studies have dealt with a highly artificial and in many respects simple experimental model, a rat fed a purified diet under strict laboratory conditions. Human liver disease, and particularly cirrhosis, is an extremely complicated disorder. The factors or agents that cause cirrhosis in patients are many and varied. If fat accumulation plays any role in the pathogenesis of human cirrhosis, it does so only in those instances where faulty nutrition is a prominent feature. In our own clinical material this is virtually limited to patients with the disease, alcoholism. There are many other types of human cirrhosis that bear no relationship whatsoever to faulty nutrition or to fatty liver disease. And even where fatty liver disease is a feature, as in cirrhosis in the chronic alcoholic patient, the pathogenesis of the disorder is far more complex than in the simple experimental model just described. A few generalizations gained from a study of the course of the disorder in one species may be applicable to the study of a more complicated disorder in another species. Beyond that, however, no application should be attempted.

In closing, I should like to pay tribute to the contributions of Miss Bernadine Wittenburg to these investigations. From 1949 until her death early in 1955, Miss Wittenburg was a research associate on our staff. In her role as a laboratory supervisor she served loyally and devotedly and was responsible for the preparation of all of the histologic specimens employed in the early studies.

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FRACTURE HEALING SPEEDED

Antituberculosis drugs appeared to be responsible for the more rapid healing of fractures in seven tuberculosis patients treated at the Central Washington Tuberculosis Hospital, Selah, Washington. Drs. Albert R. Allen and A. W. Stevenson presented their findings at the recent meeting of the American Medical Association.

Four patients with hip fractures ranging in age from sixty-two to eighty-six years had full weight-bearing in

an average of fifty-five days (forty-two to seventy-five days). Eleven nontuberculous patients with hip fractures who ranged in age from forty-seven to eighty-nine years healed sufficiently for weight-bearing in an average of ninety-four days (forty-four to 145 days). Only two of this group were ambulatory as early as the patients receiving antituberculosis drugs; *i.e.*, within seventy-five days.—*Medical Science*, 2:15 (July 10) 1957.

Studies on Congenital Goiter and Hypothyroidism in an Adult Male Patient

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AMONG individuals with hypothyroidism, and more specifically, among those with cretinism, there is a peculiar group known as "sporadic goitrous cretins." This group is distinct from the more frequently observed type of *sporadic* cretin that is athyreotic. It is also distinct from the more frequently observed type of *goitrous* cretin that is found in endemic areas of iodine deficiency. The so-called "goitrous cretin" is characterized by the presence of a goiter and hypothyroidism but without evidence of iodine deficiency or a goitrogen-containing diet as a cause of the disturbance. The hypothyroidism appears to be the result of a congenital defect in the synthesis of thyroid hormone.

In the normal person (Fig. 1), circulating iodide is trapped by the thyroid gland, oxidized to iodine and immediately bound to the amino acid, tyrosine, to form moniodotyrosine and diiodotyrosine. Further synthesis by coupling results in the formation of thyroxine which may then be released into the blood stream or be stored in the gland in conjugated form as thyroglobulin to be released at a later time. A defect in the enzymatic processes involved in any one of the steps might result in lack of thyroxine formation and consequently hypothyroidism.

In the "sporadic goitrous cretin," the defect in synthesis of hormone may be of two types: (1) a defect in oxidation of iodide to iodine may result in failure of organic binding of iodine, in which case it can be flushed from the gland by thiocyanate ion, and (2) a defect in coupling of moniodotyrosine and diiodotyrosine to form thyroxine (or a possible defect in deshalogenation

of moniodotyrosine and diiodotyrosine) in which case these compounds might be found in large amounts in the thyroid and also in the blood. The patient studied by us appears to represent an example of the latter defect. Similar cases have been studied by others.^{1,2,3,4}

Case Report

The patient was a white male asylum inmate, aged forty-eight, who was seen at the General Hospital over a period of several years.

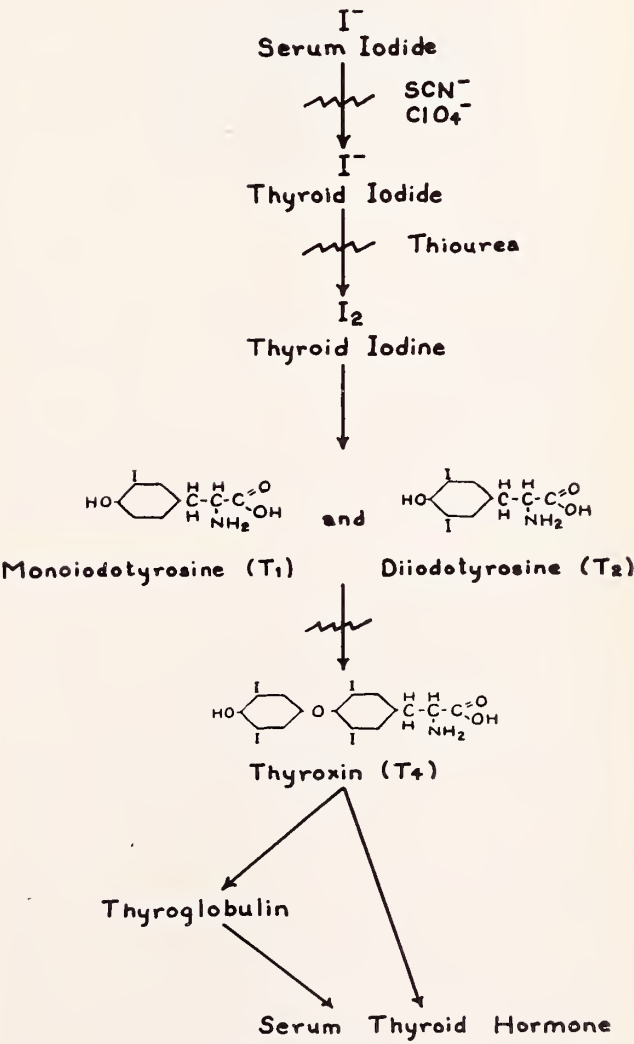


Fig. 1. Diagrammatic illustration of the formation of thyroid hormone. Sites of blocks by certain compounds or as congenital defects are indicated.

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Chronological history revealed a relatively normal early development, sitting at eight months, dentition at eight months, and walking at fourteen months. As a child, the patient was mentally slow. He frequently had

nea. The patient appeared hypothyroid, and his basal metabolic rate was minus 16 per cent. Chest x-ray revealed a widened supracardiac shadow presumably due to thyroid enlargement.

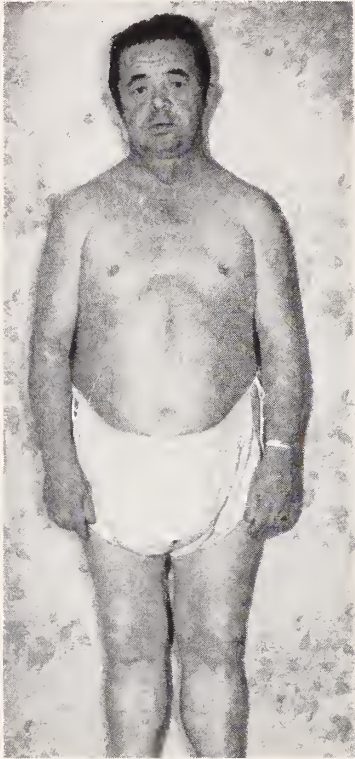


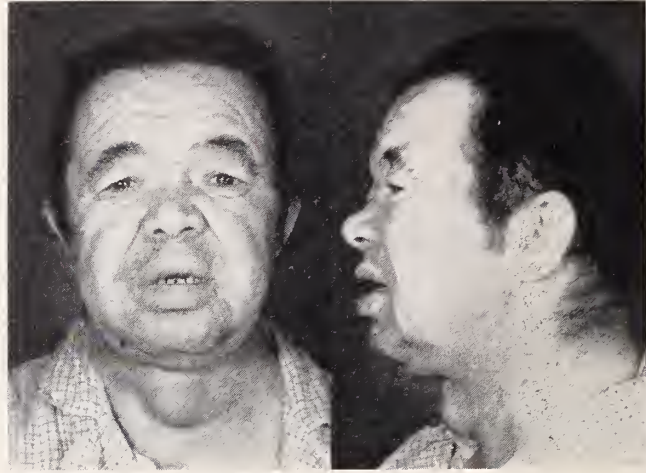
Fig. 2. Photograph of the patient demonstrating "cretinoid" appearance.

difficulty in swallowing, and food had to be removed from his mouth. He developed difficulty in breathing and was seen by the family physician who advised removal of a "gland." At fourteen years of age, the patient was admitted to a local hospital for removal of what was thought to be a persistent thymus. No masses were noted in the neck. At surgery, a large intrathoracic thyroid was removed. Pathologic diagnosis was "possible fetal adenoma."

After the operation, the patient was noticed to be more sluggish, mentally and physically. His voice was husky. He was treated for a time with desiccated thyroid, but this medication was discontinued when he became hyperactive and irritable. The patient did poorly in school, advancing to the eighth grade at sixteen years.

At seventeen years of age, he was admitted to an institution for mentally deficient children. While there, he was treated for "possible cretinism" with some improvement, being discharged at twenty-one years as "not feeble minded."

Thereafter, he worked as a newsboy until he was twenty-six, when he was committed to a mental institution because of mental deficiency. At the time of commitment, a goiter was noted in the neck. The patient stated that this had developed within a year after the first thyroidectomy. The mass was described as being the size of an orange, multinodular and soft. He complained of occasional pressure symptoms, notably dysp-



Figs. 3 and 4. Photographs of the patient illustrating anterior and lateral views of the head and neck. Note facial characteristics and anterior cervical mass.

A second thyroidectomy was performed at twenty-seven years of age. The pathological report noted numerous nodules, 1 to 3 cm. in diameter, in a gland measuring 3 x 5 x 9 cm. Microscopic sections showed a varied pattern with areas of microfollicular adenomas and other areas consisting chiefly of colloid. Malignant changes were suspected.

The patient was next seen at the General Hospital at forty-six years of age, when the thyroid status was more thoroughly investigated. Physical findings (Fig. 2) included a cretinoid appearance, puffy eyelids, thick tongue, short broad hands and feet, dry skin and myotonic reflexes. The ratio of upper to lower body segments was 1.1 to 1. A firm 4 cm. mass was noted in the anterior cervical area (Fig. 3 and 4). No bruit was heard. The patient stated that this mass had recurred within a short time after the second thyroidectomy.

Pertinent laboratory data included a basal metabolic rate of minus 36 per cent, serum cholesterol of 528 mg. per cent, and serum-protein-bound iodine of 1.8 micrograms per cent. Therapy with desiccated thyroid was begun but was discontinued within a month because of aggravation of angina pectoris which had existed in mild degree for about two years.

During the following year and a half, the anginal attacks became more frequent and more severe. The electrocardiogram showed evidence of left ventricular hypertrophy, and x-ray examination of the chest revealed displacement of the trachea to the right with evidence of tracheal compression.

Procedures and Results

In order to elucidate the nature of this patient's hypothyroidism, several additional procedures were undertaken. Twenty-four hours after the oral administration of a tracer dose of I-131, the uptake

over the thyroid was 21.8 per cent, a normal value (Fig. 5). Administration of 2 gm. of potassium thiocyanate orally caused no release of radioactivity from the thyroid area, indicating that the

Discussion

Normally, no diiodotyrosine can be identified in serum, although small amounts have been recovered after large therapeutic doses of radioac-

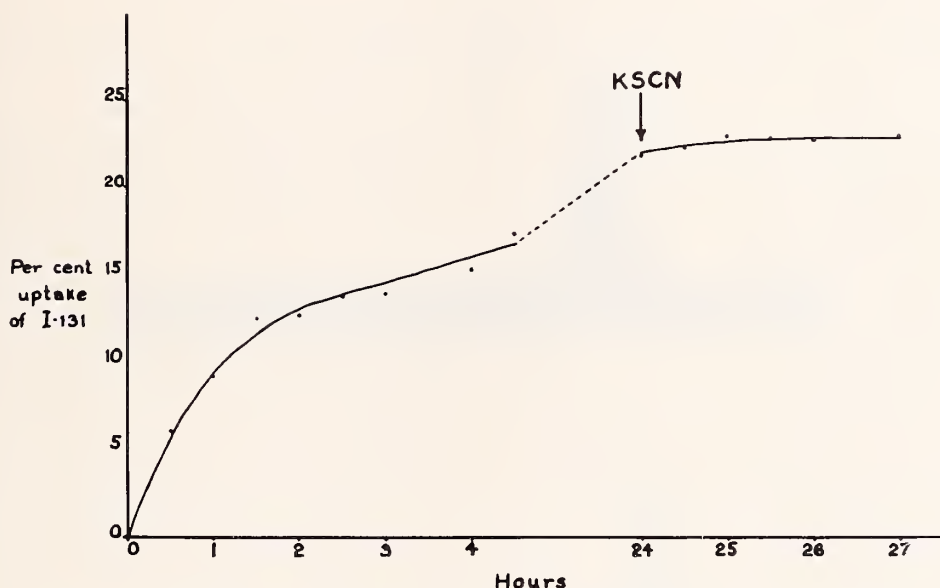


Fig. 5. Radioiodine uptake by the thyroid gland illustrating lack of effect of 2 grams of potassium thiocyanate given orally.

trapped iodine was organically bound.

In order to identify the compounds produced by the patient's thyroid, blood samples were obtained at twenty-four, forty-eight and seventy-two hours after a 0.5 millicurie dose of radioactive iodine. Each sample of serum was acidified to pH 3.5 with sulfuric acid and extracted three times with double volumes of butanol. After evaporation under reduced pressure at 65° C., the residue was applied to Whatman No. 3 MM filter paper strips and developed with descending phase chromatography using a tertiary and amyl-ammonia solvent. The paper was then cut into one centimeter strips and radioactivity determined in a scintillation well-counter. Areas of radioactivity were identified by spots produced by known compounds including diiodotyrosine, inorganic iodide, thyroxine and triiodothyronine. Significant quantities of diiodotyrosine were found within twenty-four hours, with a marked decrease in amount after three days and a relative increase in the amount of thyroxine (Fig. 6).

The administration of ten units of thyroid stimulating hormone (TSH) caused no rise in the protein-bound iodine of the serum after six and twenty-four hours.

tive iodine.⁵ It might be assumed that in this case a block in thyroxine synthesis leading to the hypothyroid state caused an increased stimulation of the thyroid with marked overproduction of diiodotyrosine. This metabolically inert compound subsequently spilled over into the bloodstream. The increased size of the gland, the rapid regrowth after surgical removal, and the histologic appearance also suggest marked stimulation of the gland. It is apparent that some thyroxine was being formed by the gland, although in small amounts and at a slow rate, suggesting that the defect in synthesis was not complete. Stanbury^{6,7} has suggested that another congenital defect may be in the thyroidal deiodination of monoiodotyrosine and diiodotyrosine. These compounds would then be lost from the thyroid and subsequently from the body to such an extent that thyroxine formation is impaired.

Furthermore, the fact that the administration of TSH did not cause a rise in the iodinated compounds of the serum, might be expected if the patient's endogenous TSH level was already high or if TSH was incapable of causing release of stored diiodotyrosine from the thyroid gland.

Therapy of this patient was precluded by the

fact that even one-quarter grain of desiccated thyroid administered daily caused an increase in the number of anginal attacks. In other individuals with this type of thyroid defect, therapy with thy-

Summary

A case of congenital goiter and hypothyroidism in an adult male patient has been presented. The nature of the thyroïdal defect was elucidated by

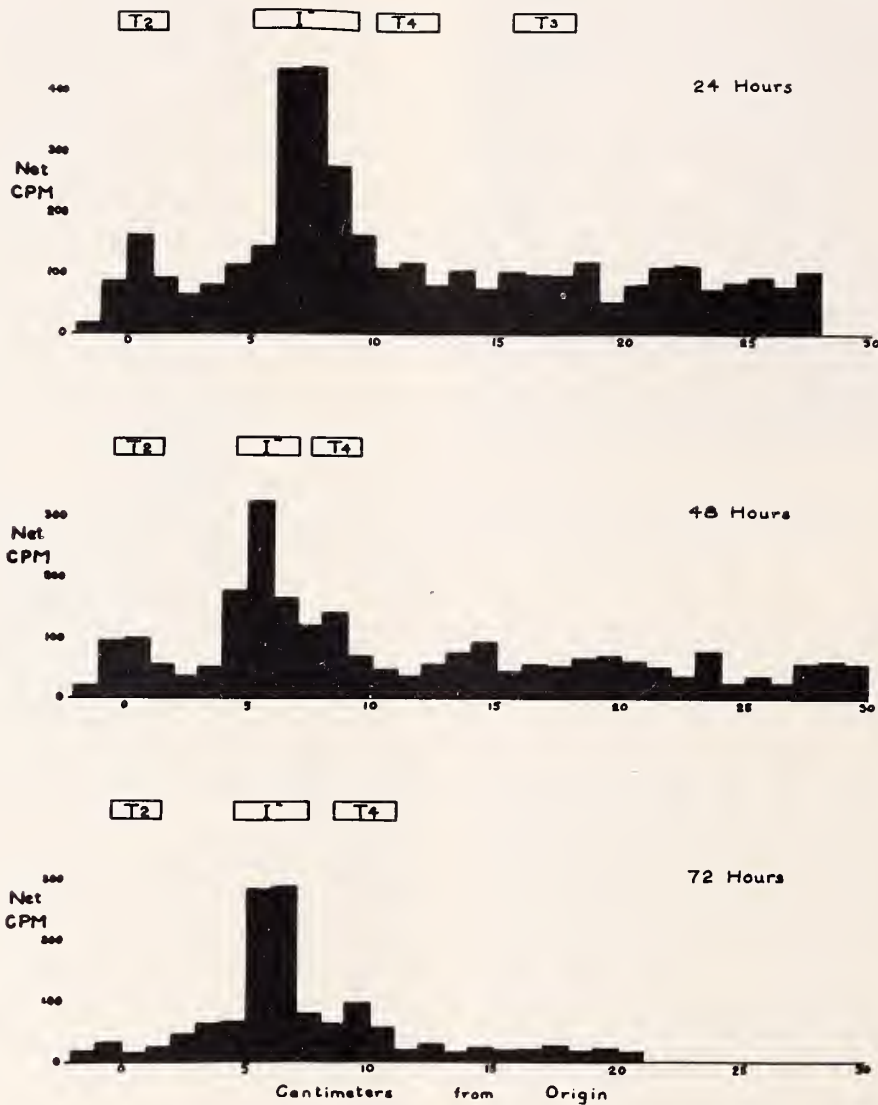


Fig. 6. Radioactivity on chromatograms of extracted serum taken at twenty-four, forty-eight and seventy-two hours after an oral dose of I-131, using tertiary amyl-ammonia solvent. Note early appearance of diiodotyrosine (T2) and slower appearance of thyroxine (T4).

roid hormone should produce euthyroidism as well as regression of the size of the goiter, presumably by TSH suppression.

Hypothyroidism of this nature, due to a congenital defect in synthesis of thyroid hormone, undoubtedly is an unusual occurrence. However, the very common so-called "simple goiter" and adenomatous goiters may, in some cases at least, represent variants of this disorder.

identification of diiodotyrosine in the bloodstream following administration of radioactive iodine. The nature of the defect in this case appeared to be in the coupling of iodotyrosines to form thyroxine.

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Pectus Excavatum

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FUNNEL chest, pectus excavatum, trichter-brust, chonechondrosternon, foveated chest are all synonymous terms identifying the same congenital malformation. This defect exists as a rather conical-shaped deformity involving predominantly the gladiolar segment of the sternum. There is a posterior displacement of the gladiolus which starts at the manubrial junction and continues dorsally toward an apex that may even be behind the ventral plane of the vertebral bodies. From this depth the xiphoid component of the sternum usually angles inferiorly and anteriorly. All degrees of this malformation exist, from the minimal indentation to a prominent pit capable of holding several hundred cubic centimeters of fluid. The third through the eighth costal cartilages are correspondingly involved by this sternal dislocation and hence assume abnormal curvatures as they course posteriorly to join with the displaced gladiolus.

Although this condition was recognized by Bauhinus in 1594,¹ and had been described carefully under the name of trichterbrust by W. Ebstein in 1882,² clinical interest in this condition was scant and sporadic until the comprehensive review in 1939 by Ochsner and DeBakey.³ Probably an even more important factor in arousing the surgeon's attention was the presentation by Brown⁴ in that same year of the anatomic aspects of and technical principles involved in the management of this problem. The structural basis for this defect, he contends, are abnormalities of diaphragmatic development and the substernal ligamentous attachments. Obvious by-products of his theories have been his recommendations for the surgical relief by elevation of the depressed bony structures. Furthermore, he has examined the natural history of the process and called attention to its often progressive state from infancy through childhood and into adult life. In addition, he has recognized and catalogued those disabling pulmonary, circulatory, and/or psychologic consequences of severe pectus excavatum.

Concerning the incidence of this malformation, Nowak⁵ reported having encountered but twelve cases in 30,000 children. In his study of the families of these children there were a total of 106 individuals, and 38 per cent (24 males, 17 females) suffered from this congenital anomaly. Predisposing factors, other than this familial tendency, are difficult to identify. Although implicated by some authors, the evidence is scant that either rickets or Harrison's groove are causally related to the funnel chest deformity. Most students of this problem, moreover, have written with obvious uncertainty as to just which mechanisms were mainly involved in the genesis of this defect. The theories proposed have been numerous and at times verged on the fantastic (abnormal intra-uterine pressures) when compared with Brown's anatomic studies.

Of the physiologic disabilities, a significant contraction in the maximum ventilatory capacity has been more frequently encountered by most investigators than a correspondingly severe circulatory impairment. The former derangement arises from several causes. There is uniformly impairment of the free diaphragmatic action. Too, in a typical case the sternal motion is paradoxical during respiration. There is a posterior displacement at the apex of the funnel on inspiration followed by an outward movement on expiration. This abnormal response may be related to any shortening present in the central tendon of the diaphragm, arising as a consequence of congenital inadequacy of the septum transversum component of the total diaphragmatic partition, and is the anatomic basis for the funnel chest deformity according to Brown.⁴ This insufficiency of the central tendon is alleged by him to pull in the sternum at the gladiolar xiphoid junction. He also affirms that frequently there is, in association with this reduction in the amount of tissue available to the tendinous expansion of the diaphragm, an associated hypertrophy or thickening of the substernal ligament.

Whereas abnormalities of cardiac function are less frequently encountered than those interfering with pulmonary action, when present they can be

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disabling.⁶ Circulatory dysfunction is more commonly provoked by bouts of paroxysmal tachycardia. Such an episode can be quite incapacitating. With an episode of tachycardia the patient

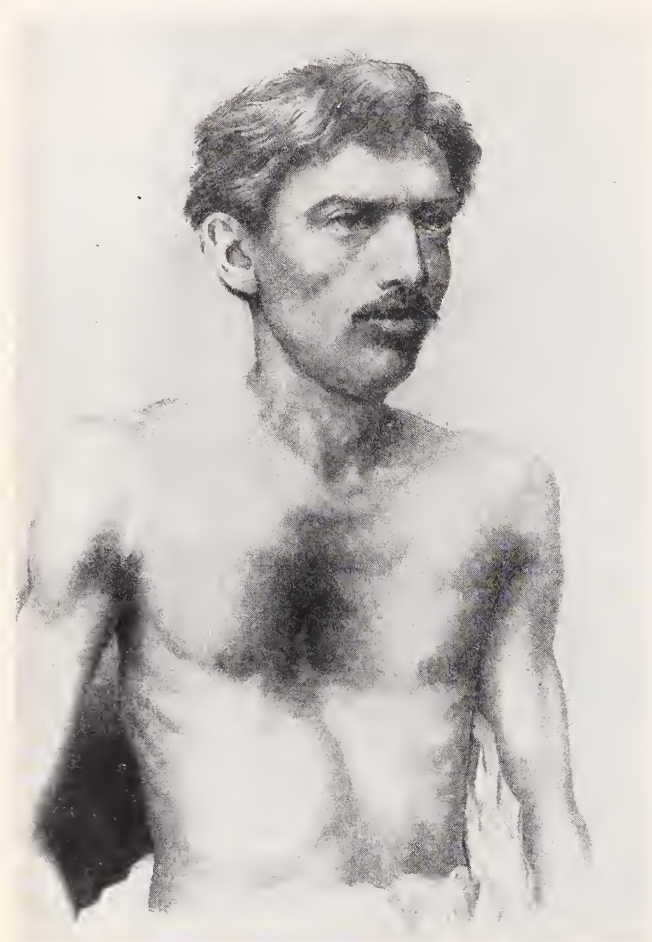


Fig. 1. Trichterbrust (from *Deutsches Arch. f. Klin. Med.*, 1882).

often will note weakness, dyspnea, palpitation and excessive sweating. In pectus excavatum patients, it is not uncommon to hear abnormal murmurs, which disappear after restoration of a more normal contour to the thoracic cage. Too, associated congenital cardiac anomalies may be somewhat masked and their true identity confused by the consequences of the heart's displacement.

Typically, the youngster handicapped by a moderately severe funnel chest is hollow chested and stoop-shouldered, walks with an exaggerated slouch and exhibits a pot-bellied profile. To meet these changes the dorsal spine is bent forward and is often scoliotic. Figure 1 is a drawing of a patient with trichterbrust which appeared in Ebstein's 1882 article.² Ordinarily, with such a physique, the individual is poorly developed physically and often has a contracted exercise tolerance both from

the encroachment on pulmonary ventilation and from any associated circulatory dysfunction. It is readily appreciated that these persons can become, by virtue of their pitiful posture and other handicaps, the object of derisive and cruel teasing. The psychologic impact on those tender and easily disturbed emotions of childhood can be readily surmised. To disrobe and thereby uncover the object of this ridicule, the funnel chest, whether at swimming or in the gymnasium, is to invite the scornful comments of the more normal and healthy. One of our adolescent patients was an inveterate truant until this disfigurement had been satisfactorily corrected.

A final analysis of the precise degree of physical disability suffered by the patient on the basis of pulmonary dysfunction and circulatory difficulties is usually difficult to make, and the emotional problems are even less susceptible of accurate calibration. With regard to the former evaluation, the maximum breathing capacity in a patient with a marked degree of funnel chest not infrequently is depressed to less than 50 per cent of normal. This determination represents a far more accurate test than a simple measurement of the patient's vital capacity. The latter determination, unless the dimension of time is included, loses its reliability as an index of pulmonary function.

As suggested earlier, the presence of bizarre cardiac murmurs and an unusual cardiac silhouette are common findings in a person with trichterbrust. This combination enhances the problems of an accurate cardiac evaluation. The association of some type of congenital heart disease adds further to these diagnostic limitations. It appears reasonable to propose, therefore, that, whenever the funnel chest deformity is linked with any cardiac disability, an additional justification for the operative correction of the malformation exists.

The Operative Management

The principles proposed by Brown⁴ and the details added by Ravitch⁷ provide us with an operative technique which is quite effective for all infants and children. With minor modifications it probably works as well as any other procedure in adults to achieve as much correction as one can anticipate in these less promising cases. Some have termed this method a radical approach to the problem. Whereas it has been suggested that simple freeing of the xiphogladiolar region from the

adherent fibrous tissue beneath it may well suffice for some infants, the subsequent evaluation of these results does not uniformly support that premise when it is applied to all.

To date twenty children and adults have been operated upon at the University of Minnesota Hospitals since mid-1952. Their ages ranged from one to forty-eight years. In one child a pulmonary valvar stenosis was corrected at the same operation. From this total experience we are inclined to the idea that corrective surgery should be carried out in any child where there exists a clear-cut indication of pulmonary impairment, cardiac dysfunction and/or a distressing cosmetic deformity. As additional endorsement of this viewpoint, we have noted that the infants have been amazingly tolerant of the required surgical manipulations. Furthermore, the eventual restoration of a near normal thoracic contour and, hence, the best cosmetic result has been achieved in young children. For nearly all individuals, however, it should be possible to improve substantially the most disabling degrees of deformity. The limited successes encountered at times in the adult group speak in favor of more frequent recourse to surgery in childhood, because a cure is virtually assurable after a well done operation carried out during this age period. In each case it should be realized that besides the benefits from improved pulmonary function and the relief from those consequences of cardiac displacement, as well as avoiding or reducing the degree of psychic trauma, are those advantages from the prophylactic avoidance of dorsal kypho-scoliotic changes and their consequent postural abnormalities.

Customarily, we have exposed the entire sternum from the manubrium to the tip of the xiphoid through a midline incision and the pectoralis fascia then reflected bilaterally. After the xiphoid process has been freed from its gladiolar attachment, it can be dissected from the surrounding fibrous elements in the linea alba and excised. All costal cartilaginous elements participating in the pectus excavatum deformity have been carefully exposed through appropriate radial incisions extending from the sternum over the osseous costal elements. We have attempted to remove each cartilage subperichondrially. These perichondrial sheaths if carefully preserved permit regeneration of a stable thoracic cage and fix the sternum in its new anterior position. To bring the sternum up from the depths, a wedge osteotomy is made in the

anterior table and all retrosternal sites of fixation released. This V-type excision of the anterior table is made transversely just at the point where the gladiolus dips abnormally away from the manubrium and towards the dorsal spine. Having freed by sharp and blunt dissection the substernal ligamentous and diaphragmatic attachments, the posterior table of the sternum can be readily raised and infracted. Finally, the lateral restraints of the sternum have been divided sufficiently to permit its over-correction to a tilted-up position. It is maintained here with two or three sutures of heavy silk or stainless steel wire which pierce the outer table only. This entire dissection can usually be made without entering either pleural space. After a thorough cleansing of the wound with a warm saline solution and securing precise hemostasis, the pectoral fascia can be closed in side-to-side manner from above down. This is usually possible to about midsternum or to that level where the insertion of more sutures appears to depress the sternal tip to a significant degree. After approximating the subcutaneous fascia and the skin, a laterally built-up dressing is applied without tension to protect against undue displacement. No external or internal struts, other than those cited, have been used in most instances in this series. However, in two adults, gentle traction was applied to a fine polyethylene tube reinforced with a stainless steel wire passing beneath the sternum. Polyethylene insulated steel wire was connected via rubber tubing to two to three pounds overhead traction. Elastic rubber tubing permits motion during ventilation, and simple changes in direction of traction enable the patient to sit or to remain supine. Traction is maintained for two and one-half to three weeks in order to hold the sternum in a slightly overcorrected position. Paradoxical motion has not been a feature of the convalescence, and even the tiniest children have done well. There has been no serious postoperative complication and no death in this series.

Conclusion

The operative management of funnel chest represents an effective means of modifying this congenital anomaly. Undoubtedly, considerable reservation about recommending this procedure will linger in the minds of most parents and many physicians unfamiliar with the accomplishments possible through contemporary surgical methods.

(Continued on Page 633)

Elective Induction of Labor

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THE subject of elective induction of labor has been a source of controversy among obstetricians for decades. The traditional conservative viewpoint that good obstetrical care demanded allowing patients to go into spontaneous labor unless interruption was indicated by some obstetrical or medical complication has doubtless enjoyed the majority position. Feeling in some circles has approached almost evangelistic fervor for this attitude, and sometimes it has been considered even a moral issue. In 1939, the Committee on Clinical Affairs of the Central Association of Obstetricians and Gynecologists sent a questionnaire on induction of labor to its members and was able to publish a report on 125 replies covering 13,891 deliveries.¹ An attempt was made to induce labor in 1,669 of the cases (12.2 per cent). The procedure failed in 11 per cent of these inductions. The report showed wide variation in the frequency with which induction was used. Twenty-six of the obstetricians who answered the questionnaire reported an average incidence of 24.1 per cent, while in the remaining group the corresponding figure was 6.6 per cent.

In our practice, we have become very liberal in our interpretation of indications for elective induction. Perhaps it is important and of considerable interest to discuss some of the factors which have influenced us in this attitude.

Until 1951, our small city of 8,000 plus population and its surrounding area in the southwestern part of Minnesota was served by very inadequate hospital facilities. The equipment was good, but the physical plant was most unsatisfactory by present-day standards. The building was a small frame church remodeled for use as doctors offices, then later remodeled for use as a hospital. There was no labor room, but there was one small delivery room. Patients labored in their hospital beds, if they were fortunate. If, as was all too often the case, beds were not available, and if more than one patient was in labor, one might find

laboring women on cots, litters, or roll-aways in the hall, and on at least one occasion on the davenport in the small lobby. This institution was serving a small but busy clinic composed of eight physicians, as well as three outside physicians. There were thirty-three beds, and since there was little possibility for hospitalizing patients by department, obstetrical cases competed for beds with medicine, surgery, ear, nose and throat, and pediatrics. In addition, many of our patients lived on farms a considerable distance from the hospital, and the threat of snow storms blocking their access to town was a source of much concern to both the patient and to her physician. In this inadequate thirty-three-bed hospital, we averaged around 415 deliveries a year.

In order to alleviate this problem, we began to select cases for elective induction of labor if certain criteria were present. Selection of patients must be rigid when labor is electively induced. Cephalopelvic disproportion must not exist. The fetus should be mature and the presenting part engaged or dipping well into the pelvis. The cervix must be ripe—that is, soft, partially effaced, and dilated at least 1 or 2 cm.

We found a surprisingly large number of patients fulfilling these criteria, even two weeks before the estimated date of confinement calculated from the menstrual history. When these criteria were reached in an individual patient, the patient was offered induction of labor. Originally, our method of induction consisted of the following routine. The patient was admitted to the hospital in the morning without having breakfast. She was given an enema and 6 to 12 grains of ergot. This was followed by stripping the membranes and/or sterile amniotomy. We have since discontinued the use of ergot. Since discontinuing ergot, our patients for induction of labor receive $\frac{1}{4}$ minim of pitocin, intramuscularly, upon admission as a test dose for unusual sensitivity to that drug. If labor does not ensue shortly after amniotomy, we now use dilute intravenous pitocin.

In general, physicians tend to follow those

¹Presented before the Minnesota Society of Obstetrics and Gynecology, Duluth, Minnesota, April 27, 1957.

TABLE I. HOSPITAL DELIVERIES
1949-1953

	1949	1950	1951	1952	1953	Totals	Per Cent
Deliveries	358	427	455	435	487	2162	100.00
Cesarean	9	6	11	11	12	49	2.26
Twins	6	5	3	1	1	16	
Inductions	67	93	96	120	142	518	24.00
Spontaneous	282	328	348	304	333	1595	73.00

TABLE II. CLINIC DELIVERIES
1949-1953

	1949	1950	1951	1952	1953	Totals	Per Cent
Deliveries	302	348	369	353	389	1761	
Cesarean	7	5	9	11	10	42	2.38
Inductions	67 (22%)	91 (26%)	93 (25%)	120 (34%)	139 (35%)	510	29.00
Spontaneous	228	252	267	222	240	1209	69.00

procedures which, in their experience, lead to satisfactory results. This outlined procedure seemed to be giving good results, and we saw no reason to modify our position when we moved into our new modern eighty-five-bed hospital in May, 1951, unless a statistical analysis of our cases proved our procedure incompatible with the practice of good obstetrics. It is altogether possible for a physician to become over-enthusiastic about a method of treatment which seems to give good results. In order to remove our experience from the realm of speculation, we have analyzed the results of our obstetrical experience for the years 1949 through 1953.

These statistics reflect our experience. They were computed for self-evaluation and are presented here only as a report.

Analysis

This report is based on a statistical analysis of 2,162 deliveries occurring in the Worthington Municipal Hospital, for the five-year period, 1949 through 1953.

Of the 2,162 deliveries, forty-nine (2.26 per cent) were by cesarean section. There were sixteen sets of twins. Of those deliveries by the vaginal route, 518 (24 per cent) were induced.

From Table II, it can be noted that of the 2,162 deliveries, 1,761 were done by our clinic group. There were forty-two cesarean sections, giving an incidence of 2.38 per cent. In 510 cases (29 per cent), delivery was accomplished by induction of labor. This figure includes both elective inductions and those induced for medical

TABLE III. INDICATIONS FOR CESAREAN SECTION

Transverse presentation	2
Breech-long ineffective labor	1
Cephalo-pelvic disproportion—long labor (9 hours)	1
Placenta previa	9
Previous section	19
Funnel pelvis	1
Breech—elderly primipara	1
Progressive muscular dystrophy	1
Generally contracted pelvis	3
Mid-pelvic contraction	7
Placenta abruptio—breech—mitral heart (baby lived 7 hrs.)	1
Myomectomy @ 4 mo. Primipara aged thirty-four—Occiput posterior	1
Brow presentation	2

49

TABLE IV. AVERAGE LENGTH OF LABOR

	Average	Others	Clinic Spontaneous	Clinic Induced
Multipara	6' 29"	8' 32"	7' 33"	3' 37"
Primipara	9' 36"	10'	10' 45"	5' 45"

and obstetrical reasons. When these figures are broken down on a yearly basis, we find our inductions of labor increased from 22 per cent in 1949 to 35 per cent in 1953.

It is of interest to note the indications for cesarean section. (Table III).

The effect of induction on the length of labor, both on multiparous and primiparous women is shown in Table IV. By way of explanation, the term "others" refers to six physicians, not members of our clinic, practicing obstetrics in the Worthington Municipal Hospital. The average length of labor for the multipara was six hours and twenty-nine minutes. Those delivered by other physicians averaged eight hours and thirty-two minutes. Multipara with spontaneous delivery were delivered in seven hours and thirty-three minutes, while those who were induced averaged three hours and thirty-seven minutes.

The average length of labor for the primipara was nine hours and thirty-six minutes. Those primipara women delivered by other physicians averaged ten hours. Our primiparas with spontaneous delivery were delivered in ten hours and forty-five minutes, while those with induced delivery averaged five hours and forty-five minutes.

Those cases in which the onset of labor was too vague and the length of labor could not be accurately determined were omitted in this portion of the report. In spite of these omissions, the length of labor was reduced by approximately one half by the induction of labor. There were no maternal deaths. There were no failures in our inductions. On two occasions, the intravenous

TABLE V. INFANT MORTALITY

	Total	Neonatal Deaths			Stillbirths		
		Number	Rate per 1000	State Rate per 1000	Number	Rate per 1000	State Rate per 1000
Vaginal Route	2113	17	8.0	18.5	15	7.0	15.6
Cesarean	49	1†	20.0		0	0.0	
Induction	518	4	7.7		1*	1.9	
Spontaneous	1595	14	8.9		13	8.1	

*Second twin, weight, 5 pounds 5½ ounces

†Placenta abruptio—breech—mother mitral heart—gr. I.P.O weight, 6 pounds 6 ounces

TABLE VI. INDUCTION NEONATAL DEATHS

1. Atalectasis—four days over estimated date of confinement—face presentation—full term by x-ray. (4 pounds 4½ ounces)
2. Eclampsia with convulsions. (3 pounds 7 ounces)
3. Atalectasis—thrombophlebitis with last pregnancy—bilateral vein stripping. (5 pounds 6½ ounces)
4. Erythroblastosis—hydrops—(induced at 36 weeks)—(7 pounds 5 ounces)

pitocin was repeated the next day and labor started.

We were interested in the effect upon the baby. In Table V, an analysis of these cases compares very favorably in both neonatal deaths and stillbirths with those figures per 1,000 births as furnished by the Minnesota State Board of Health. Our neonatal death rate was about the same in both induced and spontaneous deliveries, but we had only about one-quarter as many stillbirths in those patients induced as in those allowed to go spontaneously into labor. It can be noted that our neonatal deaths per 1,000 deliveries and our stillbirths per 1,000 deliveries were about one-half of the average figures furnished by the Minnesota State Board of Health. It is possible our good figures may be attributable to our elective induction of labor in that postmaturity of the infant is lessened. In 1951, Clifford Reid and Worcester reported that postmaturity, defined on the basis of gestational age, ranked second only to prematurity as a cause of fetal and neonatal mortality.² There are two progressive physiological changes *in utero* that are believed to account for the clinical findings in postmaturity—the disappearance of vernix caseosa of the skin and the aging process in the placenta with the resultant fall in oxygen content in the blood in the umbilical vein at the forty-third week to less than 8 volumes per cent. It is pointed out that since the fetus requires 6 to 7 volumes per cent, by the forty-third week, it is able to obtain just enough oxygen from the blood for its needs in the resting state. Walker's³ physiological studies lend definite support to the conception that risk of injury to the fetus in-

TABLE VII. MATERNAL MORBIDITY

	Total	Number	Per Cent
Spontaneous	1595	67	4.20
Induction	518	27	5.21
Cesarean	49	8	16.32

creases with prolongation of pregnancy beyond the optimal time for delivery.

Table VI lists the four cases of neonatal deaths. Two of them (Cases 2 and 4) did not occur in what we might call elective inductions. They were induced for obstetrical reasons, as listed.

There seemed to be little difference in maternal morbidity, whether patients were induced or allowed to deliver spontaneously.

Summary

1. A sketchy historical background is given to justify our use of electively inducing labor.
2. Selection of patients must be rigid, and the following criteria present:
 - (a) Cephalopelvic disproportion should not exist.
 - (b) The fetus should be mature and the presenting part engaged or dipping well into the pelvis.
 - (c) The cervix should be ripe—that is, soft, partially effaced, and dilated at least 1 to 2 cm.
3. Our method of induction is presented.
4. A statistical analysis of 2,162 deliveries occurring in our rural hospital, for the five-year period, 1949 through 1953, is presented.
5. The incidence of our induction of labor increased from 22 per cent in 1949 to 35 per cent in 1953.
6. The length of labor in both primiparas and multiparas was reduced about 50 per cent by induction of labor.
7. Our neonatal death rate was about the

(Continued on Page 657)

Chylothorax Complicating Cardiac Bypass

and Studies in Thoracic Ductography

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THE thoracic duct has long remained a hidden and unfamiliar structure. The medical student has only been cognizant of its existence. Today it assumes a seat of greatly increased importance because of the greater frequency of surgical procedures which invade the territory of the thoracic duct in the posterior mediastinum.

The collected cases of traumatic chylothorax are listed in Table I. Since Lampson's successful ligation, thoracic duct ligation for the treatment of chylothorax has been performed at least 40 times without mortality.

The purpose of this presentation is twofold: first, to report a case of traumatic chylothorax,

TABLE I. COLLECTED CASES OF TRAUMATIC CHYLOTHORAX

Author	Date	No. Cases	Therapy			Mortality
			Thoracentesis	Ligation Thoracic Duct	Other	
Shackelford and Fisher (1695-1936)	1938	41	20	0	21	50%
Lampson (1936-1948)	1948	18	7	2	9	40%
Goorwitch (1948-1954)	1954	31	10	15	6	Overall—10%
Baffes	1954	4	2	2		Duct Ligation (15)—0%
Elliot	1954	2		2		Other (16)—19%
Winters	1954	2	1	1		0
Goorwitch	1955	1		1		0
Merrill	1955	2		2		0
Guest	1955	1	1			0
Stranahan et al.	1956	3		3		0
Klepser*	1956	9		9		0
Maloney and Spencer	1956	13	11	22		0
Glenn	1956	1		1		0
Author	1956	1		1		0
TOTAL		128	52	41	36	

*18 additional cases—Nonresectable carcinoma of lung
Ligation thoracic duct

Although first discovered in a horse by Eustachius,¹ a Roman anatomist in 1565, in dogs and other species by Asellius¹ in 1622, and in man by Veslinghius² in 1634, the thoracic duct may be said to have yielded as a surgical organ a decade ago when this structure was first successfully ligated by Lampson³ for the treatment of chylothorax. Peet and Campbell,⁴ in 1943, had ligated the thoracic duct for chylothorax, but their patient succumbed suddenly following the ligation, the cause of death being undetermined.

In the era prior to Lampson's successful ligation, the thoracic duct was shrouded with mystery. The impunity with which the thoracic duct can be ligated was not only unrecognized but, in addition, ligation was strongly forbidden.^{5,6,7}

Presented before the regional meeting of the American Trudeau Society, Saint Paul, Minnesota, January 25, 1957.

complicating closure of an interventricular septal defect, and secondly, to submit a number of thoracic ductograms performed in cadavers which may serve to orient and alert the surgeon to the variations of thoracic duct anatomy.

Case Report

A white woman, aged thirty-six, was hospitalized with disabling cardiorespiratory complaints. Prior to admission she was bedridden. A diagnostic survey including cardiac catheterization gave definite evidence of an interventricular septal defect and pulmonic stenosis. On November 9, 1956, cardiac bypass was performed, employing the extracorporeal heart-lung apparatus as described by De Wall and associates.⁸ The heart was electively arrested with potassium citrate.⁹ Right ventriculotomy was performed, and an interventricular septal defect approximately 3 cm. in diameter was found in the membranous portion of the interventricular septum. This was closed with a running 2-0 silk suture. The pulmonic valve orifice admitted the small finger but

the commissures of the cusps were fused. These were readily split by the index finger. The duration of cardiac bypass was twenty-one minutes. The duration of cardiac arrest was thirteen minutes. The heart resumed normal rhythm after coronary flow was restored.

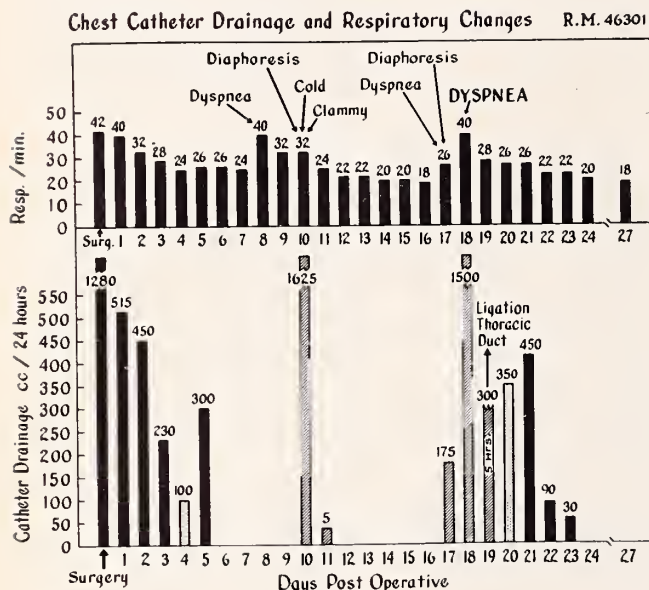


Fig. 1. Pertinent features of the postoperative period are charted, correlating symptomatology, fluid accumulation and chest catheter drainage. Ligation of the thoracic duct on the nineteenth day postoperatively controlled the chylothorax.

The arterial pH before perfusion was 7.56 and after perfusion was 7.53. The plasma hemoglobin before perfusion was 16 mg. per cent and following perfusion was 90 mg. per cent. The preoperative weight was 118 pounds; the postoperative weight was 120 pounds. The systolic blood pressure during the period of perfusion ranged between 70 and 90 mm. of mercury and postoperatively was 90 mm. of mercury. In the recovery room, the patient was conscious and responsive, and her general condition was considered excellent.

Postoperative Course.—The pertinent features of the postoperative course, including respiratory changes and chest catheter drainage, are summarized in Figure 1. Significant x-ray changes in the chest are shown in Figures 2-6. The diagnosis of chylothorax was established on the tenth postoperative day following thoracentesis. The characteristics of the fluid obtained from the chest were as follows: (1) milky appearance with an upper white layer, (2) specific gravity—1016, (3) no odor, (4) sudan fat stain—microscopic fat was demonstrable after ether extraction, (5) direct smear—no bacteria; many mononuclear cells were identified, (6) protein—3.2 grams per cent, (7) culture—no growth after two days, (8) differential study of cells—100 per cent lymphocytes. A coaltar derivative was given to the patient orally in a 75 mgm. capsule, and within forty minutes red coloration of the chest catheter drainage was noted. The chest catheter drainage in a period of six hours was 600 cc., a rate of 100 cc. per hour.

Repeated thoracentesis and chest catheter drainage

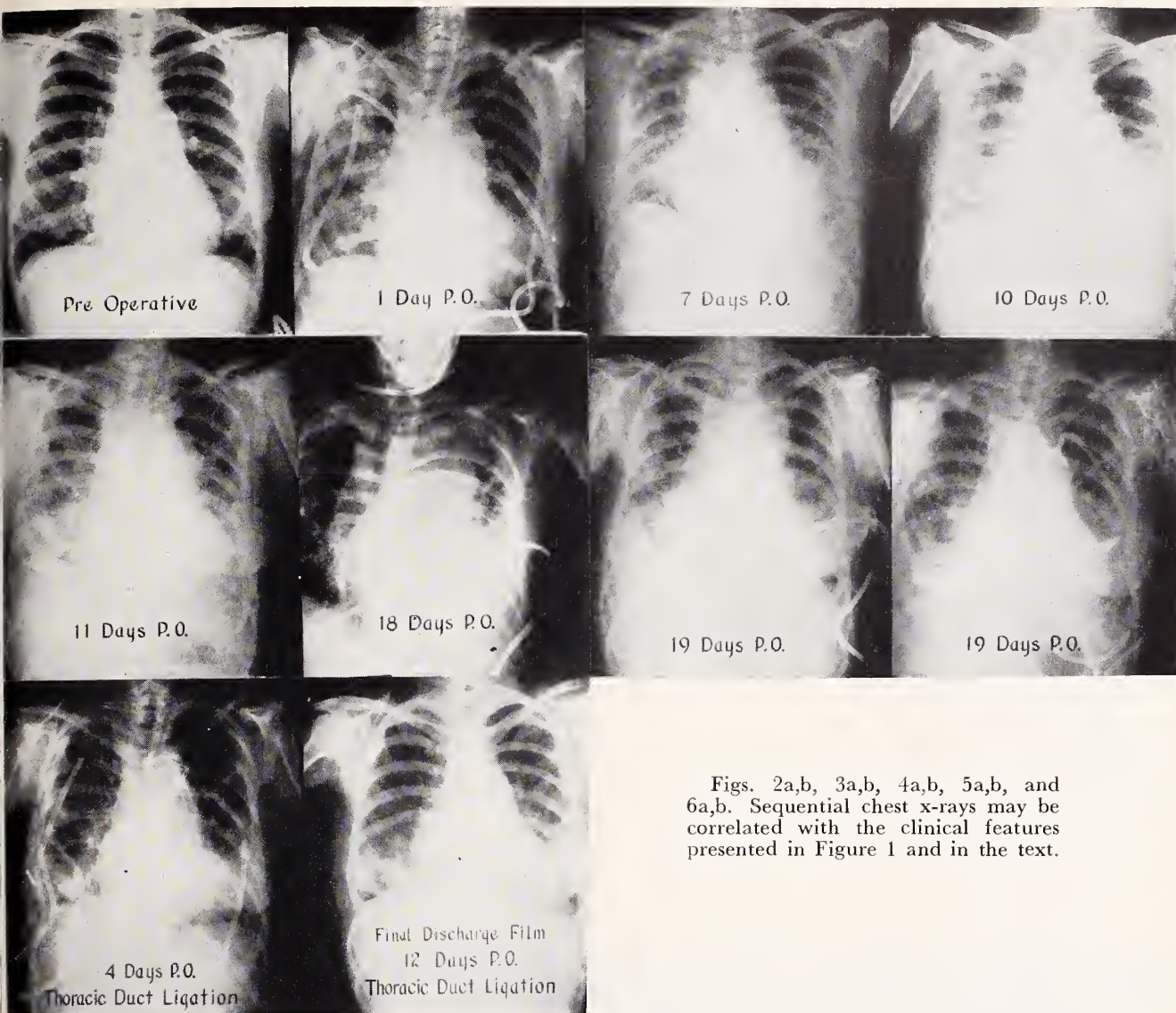
were performed on this critically ill patient and were supplemented with parenteral fluid replacement (proteins, water and electrolytes), between the tenth and nineteenth days. Because of the repeated and continued accumulation of chylous fluid, ligation of the thoracic duct was elected.

Operative Description.—On November 28, 1956, with the patient in the three-quarter prone position, thoracotomy was performed through the bed of the ninth rib. There was considerable inflammatory reaction with complete symphysis of the right pleural space. Fibrinous material covered the visceral and parietal pleurae. The lung was not congested nor edematous and there was no palpable pneumonitis. The hilar lymph nodes were markedly enlarged and boggy. Forty minutes prior to the dissection, 25 mgm. of Evans blue dye were injected subcutaneously in the thigh as recommended by Merrill.¹⁰ The thoracic duct and three parallel channels were very well demonstrated between the azygos vein and aorta by the method. A thoracic ductogram was attempted but was inconclusive. The thoracic duct and the parallel collecting structures were ligated. Appropriate chest catheters were inserted and the chest was closed in layers. The chest catheter drainage was principally serosanguinous (Fig. 1). X-ray examination of the chest on the fourth day following thoracic duct ligation showed improvement (Fig. 6a). The catheters were removed five days following duct ligation. The patient was no longer dyspneic. There was progressive weight loss noted with marked diuresis. The patient's weight at the time of thoracic duct ligation was 121½ pounds and at discharge thirty-two days later her weight was 107 pounds. The relation of the weight loss to the duct ligation was not clear. On the twenty-ninth postoperative day, the patient was breathing more comfortably without oxygen. The heart rate was 95/minute. There was no venous distention nor edema. Following thoracic duct ligation, there was an abrupt decline in appetite and food intake and her abdomen seemed distended, suggesting ascites. The liver was enlarged 2½ fingerbreadths below the right costal margin and the spleen 2 fingerbreadths below the left costal margin. The relation of these visceral enlargements to blockage of lymph following duct ligation was considered. On the thirtieth postoperative day, the patient continued to show marked clinical improvement. She was ambulatory without dyspnea. She was cheerful and alert and talked about going home. The liver and spleen were still palpably enlarged. There was some tenderness over the liver. Her weight was 106¾ pounds. On the thirty-first postoperative day, the patient was anxious to go home. There had been a reversal of the AG ratio: total protein 7.4 mgm. per cent with albumin 3.1 mgm. per cent and globulin 4.3 mgm. per cent. On the thirty-second postoperative day, the patient was discharged.

Three Month Follow-up.—The patient had resumed activities including dancing and ice skating.

Thoracic Ductograms

Thoracic ductograms were performed in thirty-five cadavers over a five-year period. The tho-



Figs. 2a,b, 3a,b, 4a,b, 5a,b, and 6a,b. Sequential chest x-rays may be correlated with the clinical features presented in Figure 1 and in the text.

thoracic duct was isolated in most instances above the diaphragm between the azygos vein and aorta. Cannulation was followed by injection of radiopaque media (70 per cent diodrast) without controlled pressures. In some instances, the left jugular, subclavian and innominate veins were obstructed by clamps. Following the injection of dye, x-rays were taken. The most interesting ductograms are presented in Figures 7-18.

Discussion

General considerations of the anatomy, embryology and physiology of the thoracic duct as well as the clinical aspects of chylothorax have been reported and can be reviewed by the interested reader. The case herein reported presents the characteristic features of traumatic chylothorax, namely, the element of trauma, probably sus-

tained during the cannulation of the left subclavian artery, followed by a latent period, respiratory embarrassment and shock-like state relieved by thoracentesis with recurrence of symptoms following the reaccumulation of chyle in the chest. Ligation of the thoracic duct appears to have been a life-saving procedure in this instance. Evans blue dye was helpful in outlining the thoracic duct and its collaterals.

Thoracic ductography has been previously reported by Lowman,¹¹ Stranahan,¹² and Celis.¹³ The dye contrast studies presented here emphasize the frequent variations in thoracic duct patterns, departures not found in standard anatomy textbooks. Collateralization as shown in Figure 14 offers one basis for the impunity with which the thoracic duct can be ligated as was demonstrated in the experimental work of Lee¹⁴ and Blalock.¹⁵

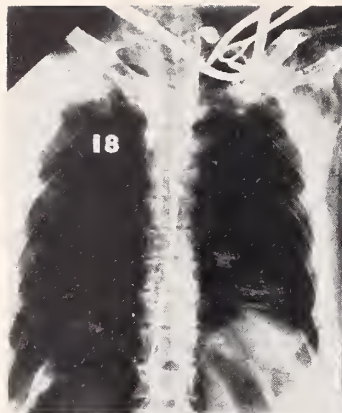


Fig. 7. Thoracic ductogram. The thoracic duct has been injected just above the diaphragm. The course of the duct is as usually described commencing to the right of the mid-portion of the vertebral column and crossing to the left of the spine at the level of the sixth thoracic vertebra, then extending cephalad to the neck forming the arch of the thoracic duct. Multiple clamps on the jugular, subclavian and innominate veins prevent entry of dye in the venous system. Note the second smaller terminal ending of the duct.

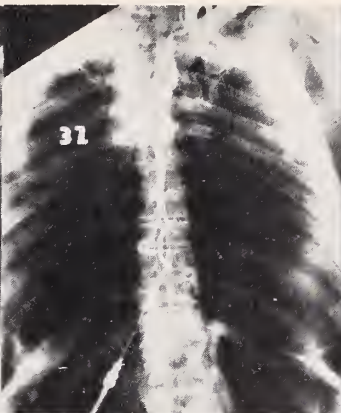


Fig. 8. Thoracic ductogram. The thoracic duct has a more tortuous course. The several points of constriction with dilatation proximal and distal to the constriction are sites of valves. Note the two terminal endings of the duct.



Fig. 9. Thoracic ductogram. The mid-portion of the thoracic duct shows a racemose pattern. The duct has been ruptured in the upper third, showing extravasation of dye. Multiple terminal endings are present in the neck.

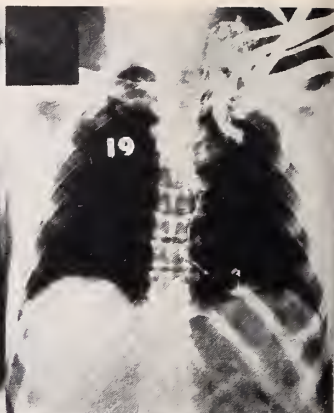


Fig. 10. Thoracic ductogram. A plexiform pattern is present in the middle third of the thoracic duct. From the upper third, a tributary is noted extending to and partially filling the right jugulosubclavian junction. In spite of multiple clamping of the left jugular, subclavian and innominate veins, extravasation of dye is present in the left hemithorax.

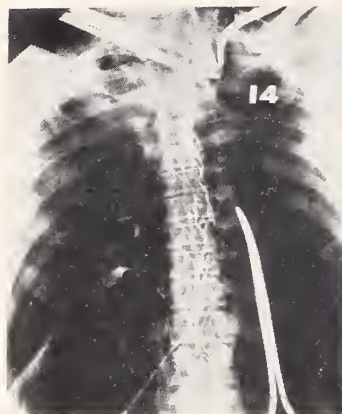


Fig. 11. Thoracic ductogram. The lymphatic collecting system in the thorax consists of a plexus of large lymphatics rather than a single trunk as in Figure 7. Two large branches from the upper third of the system extend to the right jugulosubclavian junction. Multiple possible sites of injury in the mediastinum are apparent.

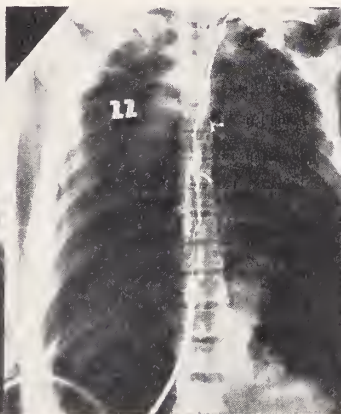


Fig. 12. Thoracic ductogram. A plexiform pattern is present in the middle part of the thoracic duct. Valves, present at the junction of major collecting trunks as the intercostals with the thoracic duct, usually prevent retrograde filling. Note that two left intercostal trunks have been partially filled in this study. Some extravasation of dye has occurred from the plexiform network.

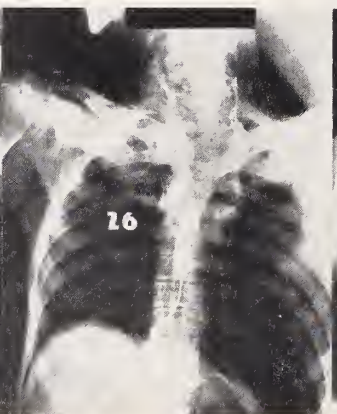


Fig. 13. Thoracic ductogram. The thoracic duct in the mid-portion is formed by a large plexiform pattern from which a single trunk arises and extends into the left neck, forming the arch of the thoracic duct emptying into the left subclavian vein. The left subclavian and jugular veins are outlined with the left innominate vein.

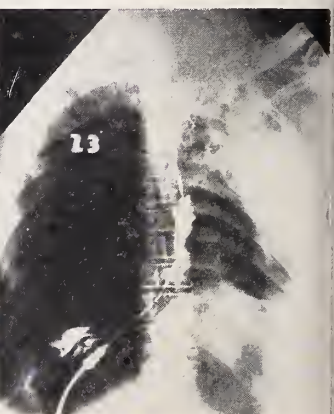


Fig. 14. Thoracic ductogram. This injection was performed in a patient who died of metastatic malignancy. A radical neck dissection had been done on the left side several years previously. Note the extensive collateralization of lymphatics in the upper mediastinum and lower neck.



Fig. 15. Thoracic ductogram. Autopsy findings in this patient included an aneurysm of the aortic arch. The upper portion of the thoracic duct has been displaced to the right by the tumor mass.

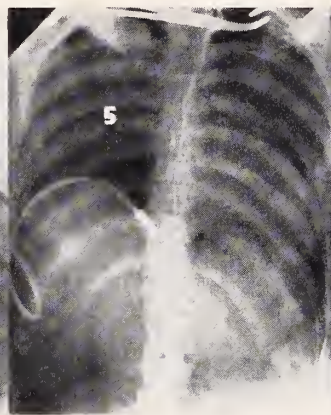


Fig. 16. Thoracic ductogram. Simultaneous cephalad and caudad injection of the thoracic duct was done. The cysterna chyli is filled. The mid-portion of the thoracic duct shows the insula of Haller.



Fig. 17. Thoracic ductogram. Caudal injection of the thoracic duct at the level of the diaphragm was performed. A parallel collateral duct is seen in the lower segment. The cysternal area is obscured by extravasation of dye due to rupture of the duct system. A large left lumbar trunk is apparent.

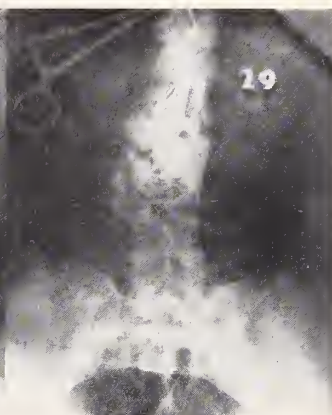


Fig. 18. Thoracic ductogram. Retrograde injection of the lower thoracic duct was performed. A true cysterna chyli is absent. A diffuse plexiform pattern is present instead.

Summary

1. A case of chylothorax complicating closure of an interventricular septal defect was successfully treated by ligation of the thoracic duct.
2. Thoracic ductograms were presented demonstrating variants of the anatomy of the lymphatic system.

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STOP AND STRETCH

It is a good idea to stretch your legs or take a short walk every hour or so during a long automobile trip or on a train or plane, advises Dr. John G. Bielawski, medical director of the Michigan Heart Association. Blood can "pool" in the legs during such inactivity and blood

clots may form, break loose and shut off circulation to the lung. Automobile drivers are most vulnerable because they sit still and don't move their legs even as much as passengers, he said.—*Today's Health*, August, 1957.

The Psychiatrist Looks at the Acutely Disturbed Patient

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"An empirick often times, and a silly chirurgeon, doth more strange cures than a rational physician . . . because the patient puts his confidence in him, which Avicenna prefers before art, precept, and all remedies whatsoever. . . . He doth the best cures, according to Hippocrates, in whom most trust."

—ROBERT BURTON: *Anatomy of Melancholy*

THE DAY-TO-DAY practice of medicine takes for granted the relationship between the physician and his patient. Much has been said and written about this relationship as a theoretic force but, as a tangible vicissitude of the lives of physicians and patients, its meaning and significance have been subordinated to other considerations that often have far less therapeutic value. Since the fact, as well as the management, of the disturbed patient is so often a reflection of this relationship, it appears worth while to examine it as a potent therapeutic force.

There is a commonly held stereotype that caricatures both the doctor and his patient. Even though it is a gross misrepresentation, like all caricatures it mirrors its subject by an exaggeration of characteristic features. This canard pictures the physician as a benevolently paternal figure, possessed of endless patience, tolerance and wisdom. Not only is he able to ferret out the complexities of a baffling differential diagnosis, but also he can select unerringly the best of modern medicine's newest discoveries with which to cure his patient. On the other hand, the patient is equally misrepresented as infinitely co-operative, passively receptive, and even stoically compliant and grateful.

If you will grant that even rarely this stiff, overdrawn, unnatural portrait is fobbed off as a reasonable facsimile of a flesh-and-blood doctor and his patient, you may follow with me the consequences of this misleading picture and see in par-

ticular the denouement witnessed in the form of an acutely disturbed patient and an equally disturbed situation clamoring for succor.

Myths, like proverbial cats, have many lives. While they appear to die when drowned by wave after wave of scientific knowledge, they also seem to possess the qualities of poltergeists, for they appear in the most unlikely situations, purring a kind of defiance to logic, reason and common sense. The explosion of a mythically idyllic, one-sided doctor-patient relationship is no exception. Such a disruption is followed by the inevitable emergency, frequently interpreted as a need for decisive action, new faces, sterner measures, stronger medicines, accusations, counterassertions and the like.

The art of medicine includes more than the perspicacious ability to select from a therapeutic armamentarium the appropriate drugs, advice or procedures necessary to do something actively to combat disease. The remedy of disease obviously implies an understanding of its natural history.

In the days when humors were rampant, the therapeutic procedures of choice were clysters, venesection and trephination. It appeared an altogether natural corollary to the theory of morbid fluids that purgation be an effective antidote. The disturbed patient was not exempt from the application of comparable metaphysical judgments, for his treatment included auto-da-fé, exorcism and incarceration. Since to be disturbed or psychotic was to be possessed, it seemed to be a soundly based therapeutic philosophy to give the devil his due.

In that era, nature was either benign or malignant. If the former state prevailed, it would be revealed in all its glory as a "natural motion" to conformity in speech, thought and behavior. By the same token, if malign forces lurked in human form, they too could be exposed for what they were by the hallmarks of berserk actions, meaningless gibberish and moonstruck thinking. There

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The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.

was only need to apply the test and not only would the diagnosis be made but also the remedy determined. Things were clear-cut, cause and effect were defined, and the application of principles and practices was consistent.

In a scientific era, similar things are often similarly clear, even though the reasoning is by a different logic and hence different causes are postulated. The clarity of one's vision depends on the glass through which things are seen. The Dark Ages were not exclusive in the use of dark glass. In all charity, then, the problem of the disturbed patient and his appropriate treatment must be examined in the light of the therapeutic philosophy held by his peers and superiors.

The cultural change that has removed us from the *auto-da-fé* has charged the physician with secular powers rivaling those once held solely by his ecclesiastic brother. The disturbed patient by common consent is now a medical responsibility. Unfortunately, this allocation of responsibility does not always carry with it commensurate authority. For authority must be recognized, appreciated and deferred to in order to be effective. The imperative to do something, make a decision, make a disposition or act, almost always undermines the physician's position to the point where he is neither a free agent to act as he deems wise nor capable of unalloyed judgment. Most often, his task is to secure peace and tranquility at almost any price. It is at this juncture in the practice of his art that the physician must examine the role in which he is cast by others, as well as the one he assumes.

At this crucial juncture, he has two alternatives. First, he can appear as he is, an identified outsider with some skill in these matters but nevertheless one who appreciates the fact that he, like the others who preceded him, is suspect until he can know and become known to the patient. Once he is trusted sufficiently, he then can offer the expertness that his presence alleges. The other alternative is deceptively appealing, for it appears to lead from strength. In this guise, the physician is an officer of the peace, an authority with unlimited power whose task it is to take over an anarchic situation and restore order by fiat. Time obviously is of the utmost importance, for once the physician is committed to a strategy, the tactical and logistic execution of it spells the difference between success and failure.

This indeed is the age of the tranquilizers. The public fervor with which they have been heralded betokens a crusade for solace in our times that has many serious implications. This is also the age of adjustment, of positive thinking, and of other-directedness versus conformity, an age in which the premium on deviation is extremely high. Consequently, the temptation to do the expedient is most alluring. It is in consonance with these tendencies that medical practitioners in some instances are beguiled to stoop to conquer. The boon of solace comes at a price; even though the reckoning is delayed, the subordination of ends to means is costly deficit-financing.

The disturbed patient always has been a quixotic figure, roaring and tilting at windmills and fooling no one but himself. In times when conformity is deemed a virtue, he is especially disruptive of the status quo and almost invites being unhorsed. Since physicians are not exempt from public opinion and pressure, they frequently rationalize such treatment by the snare that quixotic extravagances are more than well-regulated traffic will bear. In the mind of the physician, who is fortified by a glance at the stereotype of benevolent paternalism, strong-arm tactics are quickly converted to what now appears as a worthy crusade to restore tranquility.

There are three aspects of the problem of the care of the disturbed patient that should be considered in the light of the preceding comments. The first has to do with the patient and what made him disturbed. The second has to do with the physician. The third has to do with the interplay between them and what it signifies about each.

A disturbed patient manifestly does not fit the stereotyped role expected of him. He is neither co-operative nor grateful; indeed, potentially at least, he is prone to fight off every effort to help him. This is why he is said to be disturbed. Patients are people and are especially sensitive to slights, neglect, deprivation, rejection and abuse. Promises either made or implied and not fulfilled yield a harvest of frustration and resentment. The capacity to restrain an expression of these feelings varies with the age of the patient, as well as the severity and chronicity of the disease. A uniquely personal equation also exists; in different people and at different times in the life of the same person, the tolerance for conflict in one or another of its forms varies. Thus, many

factors determine the level of the water on the one hand and the height of the dam on the other. The critical factor that must be kept in mind is that innate perversity is the least likely reason for the disturbance. Good and sufficient reasons usually are present in the patient's history to account for these manifestations; if these reasons are sought for, they can be uncovered.

The most unlikely explanation for most instances of disturbed behavior is the one most frequently given. The presence of so-called toxic-infectious-metabolic factors often is alleged to be the basic cause, even though there never has been substantial evidence to document this. At various times in the history of medicine, various synonyms have been used to emphasize concepts like humors and toxic-infectious-metabolic causes of disturbed behavior of manifold sorts. The reasoning seems to be that, since these words sound impressively poisonous, they will convince even the skeptical that they must be harmful and hence of etiologic significance. It apparently makes little difference whether evidence exists for their postulated presence. In an age of science, it appears more valid to indict a chemical, a virus, a metabolic anomaly, a neurophysiologic cell assembly or a recessive gene than it does to blame purely psychologic or psychosocial symbolism, for the latter seems particularly insubstantial. Thus, instead of following our Dark Age forebears in the practice of condemning the whole patient, we usually select one or another of his systems, secretions, excretions or physiologic compositions and hold it to be the key cause of his disturbance. The remedial measures that are applied follow appropriately from this.

The disturbed patient is never less than the whole consequence of all that has happened to him physiologically and psychologically. Until the physician becomes equally familiar with all the dimensions of the problem, he is treating only part of it.

In the attempt to balance the equation of disease: treatment, one aspect sometimes is overlooked, namely the physician's unwitting contribution. His professionalism, acquired slowly during the course of a long apprenticeship, can be a barrier to the vitally important communication that is the essence of all human relationships. Exchange and interchange are the heart of communication. The process of sharing anxiety with an understanding person will slake it. On the other

hand, professionalism is an unnatural formality, a deterrent to free communication, a psychologic obstacle that effectively insulates those human qualities of honest interest and frank sincerity that must be offered to sick patients if they are to withstand the corrosive undermining caused by pain and anxiety. The presentation of simple descriptive preliminary explanations of what is going to be done and to happen is as important as superb mechanical technique, diagnostic erudition or even pharmacologic wizardry. Familiarity inevitably breeds contempt for what is thought to be obvious and commonplace, and it is a difficult chore for sophisticated professionals to remember constantly that most patients are naïve in matters of sickness and therapeutic procedures. Left to their own unguided devices, most patients substitute fantasy for fact, and the illogical conclusions that sometimes result in aberrant behavior are less the fault of the patient than they are errors of omission of critical information on the part of his attendants, who should know better.

Professionalism leads to a kind of aloofness and austerity that expects automatic deference to obviously more competent judgment and acceptance of preformed decisions. It tends to disapprove sharing the bits of information on which these judgments are based. In this light, the "good" patient is the one who passively accepts and graciously defers to professional competence obviously superior to his own.

When expectations exceed actualities, bitterness is bound to result, regardless of the reasons for the discrepancy between desire and attainment. The low tolerance of the sick for frustration makes irritability, petulance and emotional lability characteristic features of all disease and injury. Unless the origin of this susceptibility, as well as its unreasonable disproportion, is appreciated as being as much a part of illness as is fever or leukocytosis or pain, a punitive attitude of reprisal in retaliation for the patient's apparent ingratitude or impertinence is likely to precipitate an acute disruption of the relationship of the patient with his physician. The additional loss of security that this calamity imposes on a patient with already enfeebled defenses is often enough to provoke a regressive crisis of major significance. This is the disturbed patient.

Towers of strength are both reassuring and formidable. The physician and his professional en-

ourage occupy this strategically ambivalent position in the feelings of an anxious patient. Subtleties are looked for and sensed as auguries of a future that bodes uncertainty. Misreading and misinterpretation are common and the sense of desperation that follows may provoke disturbance in all realms of the patient's function. As Francis Peabody advised the physician a generation ago, the secret in the care of a patient is in caring for him.

Finally, there is further significance in the physician-patient relationship. All trauma and stress are relative. The experiential past of every person is stored with an accumulation of vulnerabilities, many of which are unconscious in the sense of being immediately unavailable to logic and reason. Their affects, however, are potential triggers for the release of feeling or behavior or thoughts that belong to bygone times. These have a peculiar algebraic quality and, consequently, the clinical expression that appears as an acute disturbance cannot always be ascribed solely to the

immediate train of events that preceded it. Events are linked in the chain of time by their symbolic connections, many of which are not at all clear to either patient or physician. A frightening childhood experience of loneliness or a long-forgotten but still smoldering adolescent anxiety about fancied injury can wax into florid signs and symptoms if the proper provocation allows it to be exacerbated.

Thus, the treatment of the medical emergency associated with a disturbed patient must be tailor-made to fit the particular patient in the particular situation at the particular time. This is why there is no good substitute for the presence of an interested physician.

"...For if he discover and declare unaided by the side of the patient the present, the past and the future and fill in gaps in the account given by the sick, he will be more believed to understand the case, so that men will confidently entrust themselves to him for treatment."

—HIPPOCRATES: Art: Collected Works

STUDIES ON CONGENITAL GOITER AND HYPOTHYROIDISM

(Continued from Page 618)

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PECTUS EXCAVATUM

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However, when serious or alarming degrees of pectus excavatum are encountered, it is important to recollect that the individual can suffer from progressive degrees of pulmonary incapacitation, cardiac dysfunction and emotional trauma. The latter is quite as capable of warping the child's behavior as the deformity is his physique. Furthermore, to achieve the best results in all of these regards, but with particular emphasis on the last consideration, it is wise to consider having the individual operated upon early in life.

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Differential Points in the Problem of Headache

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THIS discussion of some of the differential points in the problem of headache will be limited to certain aspects of some varieties, including the vasodilating headache, tension headaches, the exertional type and nocturnal headaches.

Vasodilating Headaches

The term "vasodilating headache" designates a group of headaches in which vasodilatation apparently is the main mechanism that produces pain. The most obvious characteristic of a vasodilating headache is the throbbing type of pain, with a rhythm that corresponds approximately to the pulse rate. This rhythmic qualification is made because some patients describe their headache as "throbbing" and yet demonstrate a beat with their hand that appears to have no relationship whatever to cardiac rhythm. Such headaches should be suspected of having some other cause.

However, not all vasodilating headaches throb. Another characteristic that suggests a vasodilating mechanism is rapid onset or cessation of the pain. The term "rapid" does not mean "abrupt," as with a neuralgic pain; rather, the pain builds up to a maximum in a few minutes and may recede in a similar way, although not necessarily so. Other features, such as dilatation and tenderness of superficial arteries, reddening of the face (especially when unilateral), mucosal swelling and excessive secretions in the eye or nasal passages on the side of the pain, may suggest a vasodilating mechanism. The two most obvious examples of this type of headache are migraine and so-called histaminic cephalalgia. (The latter will be considered under the heading of "nocturnal headache.") In addition, there are a number of peculiar syndromes of atypical facial pain to which many names have been applied; some of these, at least, appear to have obscure vasodilating features.

For the most part, the vessels involved in vasodilating headache are extracranial; digital com-

pression of the external carotid or superficial temporal vessels often demonstrates brief relief of pain. The participation by intracranial vessels, however, is not uncommon and indeed must be assumed in explaining most of the characteristic migrainous auras. It is thought that most migrainous headaches have an early vasospastic phase that, in some patients, may bring on the various types of auras, followed soon by the pain-producing vasodilating phase.

The typical migrainous headache needs no special comment, as it presents few diagnostic difficulties. Along with various tension components, it makes up the bulk of the headaches seen in general practice. It might be worth while, however, to mention some of the uncommon characteristics of migraine and some of the conditions that may masquerade in migrainous trappings.

The auras of migraine may present a diagnostic problem, especially in those rare instances when they occur without the headache; at times, even when the headache follows in its usual sequence, the serious implications of the earlier symptoms overshadow the headache in the mind of the patient or physician, and the significance of the sequence is missed.

Such a patient may report the sudden onset of numbness and tingling on one side of the body involving the face, arm or leg, or all three. The discomfort may last for a few minutes or a half hour. When this symptom occurs alone, its significance may be obscure. In most instances, at least some of such repetitious episodes will be followed by a typical throbbing headache, nausea and vomiting. However, specific inquiry may be necessary at times to bring out these latter events. If it then can be established that a family history of migraine exists and that some attacks have involved the other side of the body, the migrainous nature of the illness may be suspected.

The prime differential diagnosis in older patients with such attacks of episodic numbness involving different parts of the body is that of insufficiency of the basilar artery; a few patients

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with the syndrome of such insufficiency may experience headache during these episodes. However, the headache of basilar disease is usually less severe than is the average migrainous headache. Also, the basilar syndrome, although far from common, will be seen much more frequently than will migrainous phenomena when the symptoms first appear in patients more than fifty years of age. Other characteristic signs and symptoms of dysfunction of the brain stem will help distinguish the basilar syndrome from the innocuous auras of migraine.

The episodes of hemiparesis that may occur during the vasospastic auras of migraine are the motor counterpart of the afore-mentioned sensory episodes. These are more likely to persist into and beyond the headache than are the sensory phenomena. Such motor difficulties are less common than the sensory episodes, but the same associated phenomena give the clue to their migrainous nature.

Visual auras are more widely recognized because they are more frequent. These may be negative scotomas or positive scintillating teichopsia (fortification phenomena) or both; homonymous hemianopsia, although less common, also may occur. As with the motor and other sensory phenomena, the migrainous nature of these disturbances may be missed if the subsequent headache is absent, mild or minimized by the patient.

The most important single feature of these various premonitory vasospastic phenomena is that they precede the headache and usually disappear before the headache comes on. This is not invariably the case, particularly with the rare motor disturbances, but whenever the auras do carry over into the headache, migraine should not be accepted as the explanation without careful consideration of such intracranial lesions as aneurysm, arteriovenous anomalies and brain tumor.

A slight degree of ptosis or even a well-developed Horner syndrome, including ptosis, miosis and enophthalmos, is seen occasionally in attacks of migraine. However, headache that is followed by any considerable degree of ptosis should not be lightly accepted as a migrainous phenomenon.

The so-called ophthalmoplegic migraine is an extension of this problem. Although Wolff¹ considered that some cases may be explained on the basis of compression of the third, fourth or sixth cranial nerves by the swollen and edematous walls

of intracranial arteries, one should remember the possibility of other less benign explanations. Patients who exhibit severe paralysis of the extraocular muscles on the same side as their headache during the latter part of a severe "migraine" may well prove to have a progressive intracranial lesion. If the headache in these patients always recurs on the same side of the head, one should be particularly skeptical of the diagnosis of migraine. Some patients apparently do have their migraine unilaterally and always on the same side throughout their lifetime, but this is rare. In most instances, a few attacks of migraine will involve the opposite side of the head or the pain will be diffuse. Many patients have their migrainous headaches bilaterally, and the old idea that a bilateral headache is not migraine is no longer tenable.

Tension Headache

Tension headache to some physicians means any headache suspected of being psychogenic in origin, including conversion and somatization headaches. Others use the term to indicate the supposed mechanism of pain in certain patients whose basic difficulty appears to be psychoneurotic and in whom muscle tension is a common factor. Although this chronic sustained headache is usually symptomatic of an associated psychoneurosis, a small controversial group of closely related conditions exists, including fibrositic headache, myalgias and fatigue headache, that are not easy to separate from the larger psychoneurotic group. These related conditions produce pain that is less relentless than the usual tension headache, and they respond to the use of salicylates and physical therapy in varying degrees. In general, the term "tension headache" is not meant to include these "organic" conditions but is used to describe this particular variety of psychoneurotic headache. Even in this type, the mechanism of the pain is apparently muscle tension, and this in turn is considered to be an expression of the underlying psychoneurosis.

The usual story is that of a chronic, low-grade, steady, unremitting, bilateral, frontocervical or cervico-occipital headache lasting for days, weeks or months in a patient who presents other indications of psychoneurosis, such as anxiety, insomnia and morning fatigue. Bending, coughing, sneezing, heavy lifting and movements of the neck usually do not affect this type of headache to any appreci-

able degree. Tenderness on palpation of the scalp and neck muscles usually is present. Before one accepts the diagnosis of tension headache, the possibility of the previously mentioned myalgias and fibrositic conditions should be considered, and various local cervico-occipital mechanical and structural lesions should be excluded as carefully as possible.

There is a tendency to apply the label of "tension" to any chronic cervico-occipital headache that occurs in the absence of demonstrable organic disease, especially in a patient who has other symptoms of anxiety and tension. Certain circumstances exist, however, that should cast suspicion on this diagnosis of tension headache. Such suspicion is aroused (1) when the pain is unilateral, (2) when it responds favorably to simple analgesics such as the salicylates or to a brief course of physical therapy, (3) when it is definitely modified by position and activity, as when relief is obtained by resting the head against a chair or wall and when it is increased by straining at stool or cough, (4) when it is described in simple, accurate and unembellished terms, (5) when, despite chronicity, certain periods of clear-cut relief occur and (6) when the story suggests a real element of progression.

The characteristics just mentioned may be found in the cervico-occipital pain associated with cervical spondylosis and spondylitis, or in such conditions as whiplash injury to the neck, protrusion of cervical intervertebral disks, intraspinal tumors and tumors at the foramen magnum, bone tumors in the neck (primary or secondary), congenital malformations in the upper part of the spinal column and essential hypertension.

The important point is that physicians should be reluctant to ascribe this type of pain to tension headache just because objective changes cannot be demonstrated. The diagnosis also should be based on a symptom complex consistent with that diagnosis and a personality problem compatible with psychoneurosis. In the great majority of cases, such chronic cervico-occipital pain will be a tension headache, but the other possible causes just enumerated must be kept in mind.

Exertional Headache

Symonds² has written recently about exertional, or effort, headache and called the entity "cough headache."

The clinical picture in this type of headache

has been regarded for many years as pathognomonic of a serious intracranial lesion, particularly brain tumor, and it still should be so regarded if serious diagnostic errors are to be avoided. However, it is now apparent that a group of patients does exist in whom extensive investigation fails to reveal any intracranial lesion to explain the symptoms and whose future course may well prove to be favorable.

I do not know of any way to distinguish on the basis of the symptoms alone between benign exertional headache and headache that is symptomatic of an intracranial expanding lesion. All such headaches must be considered as potentially dangerous. However, when the results of a neurologic examination are negative, when electroencephalographic and contrast studies reveal no abnormality, or when such a headache has been present for many months or years without progression, it is comforting to realize that such an entity as exertional headache apparently does exist.

The characteristics of exertional headache are as follows. The headache is brought on from complete comfort within a few moments, if not immediately, by any exertional maneuver, such as coughing, sneezing, straining at stool, bending or lifting. It may last from a minute or so to an hour, but it is more often of short duration. It is to be distinguished from the common condition in which a headache already present is made worse by those same exertional activities.

Symonds² reported on seventeen patients followed for one to twelve years without the appearance of any neurosurgical disease. At the Mayo Clinic, my associates and I have been following a growing group of such patients since 1952. In a recent unpublished survey, we had replies from twenty-eight patients whose headaches had been present for two to twenty-five years. Their ages ranged from fifteen to seventy years, but this type of headache appears to be more common after the age of fifty years. Many (60 per cent) of our patients have had electroencephalograms, air studies or angiograms. Of the entire group followed thus far, only two patients later have shown some demonstrable intracranial lesion to explain their symptoms.

The importance of this group of patients is mainly for the reassurance its existence gives the physician when results of extensive investigation have been negative. It apparently is reasonably well established that certain exertional headaches

may be benign; the chance of spontaneous disappearance of symptoms is apparently about 20 per cent, and the condition in two out of three patients in our series has tended to improve. It is obvious, of course, that any worsening of such a headache, any change in its character or the development of other significant symptoms requires complete re-evaluation of the problem.

Nocturnal Headache

Nocturnal headache refers to one that, although it may occur on various occasions during the day, tends to be more common and more troublesome during the hours of sleep. This circumstance in itself is disturbing. In addition, some of these headaches may indicate serious disease. A considerable variety of conditions may feature the symptom of nocturnal headache. Four of these will be considered in this presentation.

Histaminic Cephalalgia.—This special variety of vasodilating headache was first given the name of "histaminic cephalalgia" by Horton,³ in 1941. There appears to be reason to question the specific etiologic relationship of histamine to this clinical syndrome, but a typical case is so characteristic that some specific designation is desirable. The term "Horton's syndrome" has been selected by some authors, whereas others use such terms as "cluster headache" or "seasonal headache"; one author,⁴ in his efforts to escape any etiologic implications, has designated the condition as "a particular variety of headache." Whatever it is called, the typical syndrome is striking.

This type of headache tends to appear during the fourth and fifth decades of life. Unlike migraine, the syndrome is more common in men than in women. Although headaches of this sort may appear during the day, the classic one is nocturnal, usually developing to a maximum within a few minutes or being maximal when the patient awakens. As a rule, the pain is unilateral and often is about or deep behind one eye, but may extend from there along the side of the head into the face or down into the shoulder. The flushing of the face, "running" of the nose and stuffiness of the homolateral nostril attest to the vascular nature of the disorder but are not necessarily present. The pain of this headache is of the greatest severity. It may or may not be throbbing. Patients do not remain in bed with this headache; rather, they get up and pace the room. The su-

perficial arteries over the involved temple usually are distended, swollen and tender, but this need not be so. When only deeper branches of the external carotid artery are involved, there may be little to see except the patient's very evident distress. The distinctive features of this type of headache are the sudden onset of pain, its great severity, the brief duration (twenty to sixty minutes) and the fairly rapid subsidence; superficial tenderness and reddening of the skin or mucosal edema usually is present but not invariably so.

The erroneous diagnosis of tic douloureux, or trigeminal neuralgia, is made in a considerable number of these patients. Some even have had section of the fifth cranial nerve or occipital nerves or both. Tic douloureux and histaminic cephalalgia are both manifested by extremely severe pains about the head and face of sudden onset and sudden cessation. Pronounced tearing of the eyes may be present in both conditions, but lacrimation is more likely to be bilateral in tic douloureux and unilateral in Horton's syndrome. By the time a patient with tic douloureux has pressed a hot or cold cloth to his eye for a few minutes, and some do this despite the presence of trigger points, that region may become red and injected in appearance and may be so described by the patient in response to questions, without any elaboration on how it achieved that appearance. Both types of pain tend to recur in attacks lasting days to weeks. These similarities may be confusing indeed at first glance, but there are even more differences, if they are sought out.

The most obvious difference is in the pain itself. The pain in tic douloureux has a flashing, lightning-like, often repetitively stabbing quality, and it persists only for seconds or rarely more than a minute. This pain may be repeated quickly, so that the patient may speak of a pain lasting twenty minutes or more; however, close questioning discloses that this "pain" consists of a series of briefer pains. The pain of tic douloureux is brought on by various activities, such as talking, chewing and touching the face at certain trigger points. Not every pain can be so explained, but the patient knows that during an attack he can seldom take liberties with such activities without paying the penalty. These trigger points are not present in Horton's syndrome, a fact that can be established when the patient is examined. The distribution of pain is a point of distinction; the pain in tic douloureux is confined to the distribu-

tion of one or more branches of the trigeminal nerve, whereas the pain of the vasodilating headache may be felt throughout the distribution of the external carotid artery. The age of the patient also may be helpful. Tic douloureux occasionally is seen in patients less than forty years of age, but most patients are at least fifty years of age before it appears. Horton's syndrome has been known to appear for the first time in patients more than fifty years of age, but most of them are less than fifty.

Headache Associated with Brain Tumor.—Nocturnal headache, particularly of recent development, makes most physicians consider the possibility that the patient has a brain tumor or some other expanding intracranial lesion.

There is no typical pain that is characteristic of brain tumor. The life history of such a headache often gives a better clue than does the type of pain. The pain may be a dull ache that is more bothersome than incapacitating, or it may be explosive in severity, as when the dynamics of the intracranial fluid are interfered with. As a rule, however, it is not an outstandingly severe pain and it often responds well to compounds of acetylsalicylic acid (aspirin). It may or may not be associated with nausea or vomiting or both. The well-known projectile type of vomiting is not often present except in children.

As already noted, the life history or behavior pattern in a series of headaches may suggest the presence of an intracranial expanding lesion. When the headache varies unpredictably in its severity and when, over a period of weeks or months, it gradually becomes more frequent and more severe, an expanding lesion should be seriously considered. When such a headache is worsened by straining at stool, lifting and bending, or jarring or sudden turning of the head, particularly when it is brought on from complete comfort by such exertional activities, there is real need to exclude progressive intracranial disease.

Headache Associated with Hypertension.—It is not known why certain patients with hypertension have headache while others with an equal or greater degree of hypertension do not. This type of headache is likely to be dull, diffuse and throbbing. It is often occipital, and it may be unilateral. It tends to awaken the patient in the early morning hours, or it may be regularly present at the morning awakening. The headache often improves

when the patient assumes an upright position, and use of aspirin often helps. The pattern is repetitive or periodic but not progressive as a rule.

The mere presence of hypertension is not enough to identify this headache, since increased intracranial pressure tends to cause secondary hypertension. The absence of the characteristic funduscopic changes usually seen in significant hypertension should suggest caution in ascribing any headache to the hypertensive group of diseases, regardless of the blood pressure. Under such circumstances, intracranial expanding lesions should be considered as a possibility. Another condition that may produce headache and hypertension with normal-looking fundi is pheochromocytoma.

Headache Associated with Temporal Arteritis.—This type of headache is not truly nocturnal; it tends to persist all day as well, but patients complain that it is especially troublesome at night. The headache of cranial or temporal arteritis occurs almost exclusively in patients more than sixty years of age. It is usually bilateral, with associated tenderness of the scalp, but it may be unilateral or hemitemporal. The pain is usually constant, steady and moderately severe, and it is little influenced by movement of the head, position or cough. In many patients, the enlarged, firm, tortuous, temporal arteries stand out, with reddening of the adjacent skin and extreme tenderness to touch. In others, visible vascular changes are absent. These headaches ordinarily are resistant to the milder forms of analgesics. Considerable constitutional reaction, such as irritability, undue fatigue and pallor, often is present. When cranial arteritis is thought of, the laboratory can give real help in that the erythrocytic sedimentation rate is almost invariably 100 mm. or more during the first hour (Westergren method), and anemia often is present. Biopsy of an involved segment of an artery is the preferred method of establishing the diagnosis.

Cranial arteritis is essentially a self-limited disease, but it has one extremely serious complication, namely blindness, which occurs in one or both eyes in 30 to 40 per cent of these patients unless adequate treatment with corticosteroids is instituted early. It is because of this visual damage, usually caused by ischemic optic neuritis, that early recognition and treatment of cranial arteritis are important. Unfortunately, the headache is not a

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Treatment of Some Types of Headache

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IN ORDER to be concise and informative this discussion will be limited to the more common types of headache (migraine and tension headache) and to two types (histaminic cephalalgia and cranial arteritis) that are uncommon but urgently require prompt and careful treatment. Physicians are constantly reminded that a carefully taken history is the proper beginning for the solution of any medical problem. A repetition of this truism would be tedious were it not for the fact that the treatment of any headache is apt to be poor or to fail if the taking of a detailed history is neglected. The frequency and duration of headaches, as well as the time of day or night when they start, will, to a great extent, determine the type of medicine and the mode of administration to be used. The person who becomes nauseated and vomits early in the course of a headache will require rectal or parenteral administration of medicine. A careful inquiry concerning medicines previously employed will allow the physician to avoid the use of remedies that the patient has found ineffective or harmful, or may lead him to recognize that such remedies were ineffective because improperly used. A patient who has in the past displayed an idiosyncrasy to a drug will be less than grateful if the physician makes the mistake of giving such a drug as a result of inadequate history taking.

Vasodilating Headaches

A discussion of the treatment of vasodilating headaches is simplified if they are divided into those of long duration (migraine) and those of short duration (histaminic cephalalgia).

Vasodilating Headache of Long Duration.—A classic attack of migraine usually evolves in three stages. The first is that of vasoconstriction and the second is that of vasodilation. If this second stage is prolonged it merges into the third stage in which the arterial walls become edematous.

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The stage of vasoconstriction may be recognized by the occurrence of paresthesia, focal weakness, aphasia or, most commonly, visual disturbances. Ordinarily, this stage requires no treatment. When it assumes major proportions because of long duration or the alarm experienced by the patient, treatment may be needed. A variety of vasodilating agents may be used. The simplest is nitroglycerine in the form of a 1/100 grain tablet placed between the tongue. Amyl nitrite is a potent vasodilator but its effect is too transitory, its use attended with too much drama, and its residual odor too reminiscent of unclean feet to be a good choice. If a vasodilating drug is used, it may be expected to relieve the stage of vasoconstriction but will not necessarily abort the subsequent headache.

The stage of vasodilation is treated by the use of vasoconstricting drugs. Of these drugs ergotamine tartrate, with or without caffeine, is the most useful and reliable. Preparations are available for three methods of administration: tablets for oral use, rectal suppositories, and ampules for parenteral injection. The method of administration varies with the needs of the patient. If nausea and vomiting do not occur early, tablets containing a mixture including 1 mg. of ergotamine tartrate and 100 mg. of caffeine (Cafergot-PB or Wigraine) are the preparation of choice. Initially, two tablets are given at the onset of a headache and this dose is repeated every twenty to thirty minutes until relief is obtained or until six tablets have been given. This cautious, pedestrian method of administration has two advantages. It allows the patient to discover whether he is sensitive to ergot. On rare occasions muscle cramps, nausea, vomiting, or paresthesia may result from taking as little as two or four tablets. If such idiosyncrasy exists, it is well to recognize it as a result of using as small a dose as possible. The second advantage is that this method makes possible a rough approximation of the minimal dose needed to control a headache. Occasionally, a patient will be relieved by as little as two tablets. Those patients who require six tablets taken in

the manner described may find that a subsequent headache is controlled by only four tablets if these are taken at once and as early as possible.

Should this method of administration fail to bring relief it is well to inquire carefully as to the exact method the patient used in taking the medicine and when in the course of the headache he took the first dose. Many patients with migraine are inveterate gamblers. They are always betting, with themselves, that this headache will not be like the 100 or more similar headaches that have preceded it. "If I don't pay any attention, it will go away," or "I'll just work this one off," are examples of excuses they offer themselves for not taking medicine as directed. They must be aided to realize that early use of the medicine in adequate amounts greatly enhances their chances of gaining relief.

If nausea and vomiting occur early in the course of the headache, oral administration of medicine should be avoided. For the headache that characteristically reaches a maximal intensity in a short time, it is well to give a hypodermic injection of 1 or 2 cc. (0.5 to 1 mg.) of ergotamine tartrate (Gynergen) or 2 cc. (2 mg.) of dihydroergotamine methanesulfonate (D.H.E. 45). If there is no relief in one hour, another 1 cc. of either drug may be given. The headache that is slow to reach a maximal intensity may be controlled with a suppository containing 2 mg. of ergotamine tartrate and 100 mg. of caffeine (Cafergot-PB). Another suppository may be given in one hour if the first is not effective.

Methylisooctenylamine (Octin) is a relatively weak vasoconstrictor and less effective than ergot. but is worthy of trial if the patient is sensitive to ergot. The initial dose of 1 cc. (0.1 gm.) is injected intramuscularly and may be repeated in thirty to sixty minutes, if needed.

Inhalation of 100 per cent oxygen has been advocated as a vasoconstrictor to be used early in the course of a migraine attack. Its effect is often disappointing, but its use should be considered if other measures seem unsafe or are impractical.

Treatment given as described above may fail to bring relief and the headache may progress to the third stage. The edema of the vessel walls makes it impractical to try to influence the pain with vasoconstrictors. In this stage, the patient is usually nauseated and vomiting and any medicine should be given by rectum or parenterally. It is

in this stage that the use of narcotics may be justified. Here again, a carefully taken history is of value, since it prevents the administration of those narcotics which the patient has learned from experience may cause him unpleasant side effects. In addition to analgesics, the patient may be helped by the use of sedatives, easily given in the form of rectal suppositories containing a barbiturate. Protracted vomiting may be controlled by the intravenous administration of dimenhydrinate (Dramamine). One cubic centimeter of the parenteral solution containing 50 mg. of the drug is diluted in physiologic saline solution to 10 cc. and given intravenously over a period of two or three minutes. The intravenous use of dimenhydrinate may be tried early in the second stage of a headache; it sometimes controls the pain as well as the vomiting. Needless to say, treatment of headache at any stage is enhanced if the patient retires to a darkened, quiet room.

So-called interval treatment of migraine will not be discussed here. The awesome number of such treatments that have been advised attests to the fact that no regularly reliable or satisfactory method of interval treatment has yet been published. "Yet migraine has been the happy hunting-ground of the theorist, and the problem has been attacked by representatives of all branches of medicine. Each in turn has discovered in migraine phenomena pertaining to his own specialty; each in turn has hit upon the true nature of the malady; in turn, each has found the infallible remedy."¹ If the physician recognizes distinct physical abnormalities in his patient, for example, dental, allergic, endocrine or other, an attempt at their eradication or control is justified. Emotional tension undoubtedly plays an important role in triggering the attacks of many migraine sufferers. Faulty attitudes of the patient or environmental factors that seem to lend themselves to relatively simple manipulation should properly receive attention.

Vasodilating Headache of Short Duration.—The classic example of such a headache is the individual attack of histaminic cephalalgia. The onset and progression to maximal intensity may be so rapid as to seem explosive. These attacks may last as little as ten or fifteen minutes and for that reason any measure used to relieve them must take effect rapidly. Medicine taken orally is seldom effective. In contrast to its frequent failure in migraine, the inhalation of 100 per cent oxygen

during these headaches proves effective often enough to make its trial of distinct value. It is best administered through a well-fitting mask. If relief is not obtained after five minutes of breathing oxygen, the trial may be considered a failure. If a few trials are successful, the patient should obtain a tank of oxygen (such as is used in welding), a reducing valve, rubber tubing and some inexpensive, disposable plastic masks. The major expense of this equipment is the deposit on the oxygen tank and cost of the reducing valve. The deposit is regained when the tank is returned. The valve may usually be returned for some reasonable portion of its purchase price. Since these headaches commonly cause greater trouble at night, the apparatus may conveniently be kept in the bedroom. One patient's headaches were so dreadful and relief with oxygen so prompt that he kept an oxygen tank at home and another in his office. He carried a third and smaller tank in his car.

Should the inhalation of oxygen fail, the most reliable remedy is a preparation of ergot, such as Gynergen or D.H.E. 45 given parenterally. The patient is taught to use a needle and syringe properly and to give the drug to himself. When it is recalled that a patient with histaminic cephalalgia may have four to six attacks in twenty-four hours, the thought of giving so much ergot may seem forbidding. Fortunately, the interruption of one attack by the injection of ergot may rid the patient of all attacks for as long as twenty-four to thirty-six hours, so that such frequent administration is usually not necessary. For those patients who have most of their attacks at night, the use of an ergot-caffeine suppository (Cafergot-PB) at bedtime will often insure an uneventful night's sleep. The patient whose nights have been made miserable for several weeks will consider this something of a miracle.

The patient who has gained respite from the head pains will be eager to know what steps he may take to forestall them in the future. This question has no certain answer, but histamine "desensitization"² may be employed for this purpose and seems to benefit a sufficient number of patients to make it worthy of trial. The patient should be taught the proper technique of making a subcutaneous injection and caring for needle and syringe. A solution containing 0.275 mg. of histamine diphosphate per cubic centimeter may be obtained in 20-cc. vials. Injections of this solution are given twice daily. The initial dose is 0.10 cc.

Each succeeding dose is increased by 0.05 cc. Thus, the second dose is 0.15 cc., the third 0.20 cc., the fourth 0.25 cc., and so on. The amount given at each injection is in this manner gradually increased until a "maintenance" dose is attained. This should not be more than 1 cc. and may be less. If, during the course of gradually increasing the dose, any flushing of the face or any headache is noted the next dose should be reduced to 50 per cent of the dose that caused these symptoms. Subsequent doses should again be increased gradually as described above. Some patients find that any dose greater than 0.70 cc., for example, causes flushing or headache. For such a patient the maintenance dose should then be 0.70 cc. This maintenance dose, whatever it may be, should be continued twice daily for two to four weeks and then reduced to once daily for a month. At the end of this time use of the drug may be stopped if the patient is free of headaches.

The doses of ergot so far mentioned may seem large. The following remarks are made in explanation. While serious complications from the ill-advised use of ergot preparations can and do occur, this danger is overrated. Doses which are usually considered excessive may be taken for long periods with relative impunity as is evidenced by reports such as that of Peters and Horton.³ This is not said for the purpose of suggesting a careless attitude toward the use of these drugs, but rather to combat the overtimid attitude that results in the use of amounts that are too little and too late. As with any potent drug, the dose of ergot should be enough, that is, enough to control the symptoms or enough to demonstrate that the drug is ineffective, either from failure to relieve pain or from the occurrence of toxic side effects.

Some well-defined contraindications to the use of ergot therapy include impaired hepatic or renal function, phlebothrombosis, and severe anemia. Hypertensive cardiovascular disease and angina pectoris present a different problem. Ordinarily the avoidance of use of ergot is advisable. However, the protracted anguish of a migraine attack may have a greater adverse effect on these conditions than the use of ergot if it provides prompt relief. The preparations of ergot commonly used for control of migraine do not contain sufficient oxytocic substance to be capable of altering the course of a normal pregnancy. However, if the patient should take an ergot preparation and suffer some difficulty with gestation, the physician

who prescribed the drug would almost certainly be the recipient of ill will or worse. For that reason, the use of some remedy other than ergot is advisable for the pregnant woman. Fortunately, the onset of pregnancy is usually associated with a diminution of the frequency and severity of migraine attacks.

Cranial Arteritis

The pain of cranial arteritis is in itself usually severe enough to demand treatment, but the ever present danger of blindness is an even more compelling reason for prompt and vigorous treatment. While the use of corticosteroids does not cure the underlying disease, it does halt the progress of the illness, relieve pain and prevent blindness more effectively than does any remedy so far employed. Patients with this condition should be considered as presenting a medical emergency and treated accordingly. On the first day 300 mg. of cortisone is given intramuscularly, one half of the total dose being given on each of two occasions at an interval of twelve hours. On the second day the same schedule is followed but the total dose is reduced to 200 mg. On the third day the total dose may be 150 to 200 mg. divided into four equal portions given orally at intervals of six hours. The latter dose may be continued for about six weeks. At the end of this time the total dose per day may be reduced by 12.5 to 25 mg. every three or four days until it is lowered to 12.5 mg. per day. At this level, administration of the drug may be stopped. An increase of the dose is required if at any time during the period of reduction of dose the symptoms recur or the erythrocyte sedimentation rate rises. Treatment may have to extend over nine to twelve months. In order to prevent serious disturbance of electrolyte balance, the total amount of sodium in the diet should not exceed 2 gm. per day, and 3 to 6 gm. of potassium chloride should be given per day. Before the advent of cortisone it was sometimes observed that removal of a segment of the affected artery was followed by relief of pain. Biopsy of an affected artery is commendable as an aid in diagnosis but should not be relied upon as the sole method of treatment.

Tension Headache

The immediate source of pain in tension headache seems to be prolonged, abnormal tension in the muscles of the neck and head. This in turn is

usually associated with varying degrees of emotional tension. Therefore, efforts at treatment should be directed toward lessening the muscle and emotional tension. The use of simple analgesics, such as aspirin compound, is helpful in the individual attack. In an effort to relieve emotional tension, sedatives such as carbromal, barbiturates or any of the numerous "tranquilizing" drugs may be used. Physical measures, such as local heat, massage and cervical traction, are of definite value in reducing muscle tension. The patient may be instructed in the manner of using these measures and thus continue his treatment at home. This type of therapy has been described in detail by Erickson.⁴ Vasodilating drugs may be of some aid if taken regularly between headaches. Nicotinic acid is inexpensive, is simple to use, and is an effective dilator of extracranial arteries. It is given in doses of 50 to 200 mg. four times a day, thirty minutes before each meal and at bedtime. The patient will be spared an unpleasant surprise if he is cautioned that an occasional dose of nicotinic acid may cause him to flush, especially about the head and neck. This flush appears about ten to fifteen minutes after he takes the medicine and lasts twenty to thirty minutes.

The treatment of headaches can be made, in writing, to seem much simpler than it really is. Occasional failures are bound to occur. Some patients seem refractory or insensitive to all measures mentioned thus far. Adverse environmental factors and complex emotional problems may conspire to make these simple measures ineffective. Admission to a hospital followed by prolonged medical and psychiatric care may be necessary. However, the majority of patients with troublesome headaches can be materially aided if the physician displays an active interest in their problems, encourages regular office visits and uses ingenuity in varying the doses and types of drugs to suit the needs of the patient.

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Photosensitivity

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THE SUN has been worshipped for centuries, but only recently has much attention been paid to the undesirable consequences of chronic sun exposure and to photosensitivity, both in the medical literature and the lay press. Dermatitis caused by the sun are increasing in number due to the use of new drugs which produce photosensitivity reactions. The national morbidity from sun exposures is high and includes skin cancer. From a cosmetic standpoint the sun ages the skin, dries and fissures the lip, and severe sunburn may result in mottling of skin. The only proven benefit derived from the sun in the healthy individual is the production of vitamin D in infancy. The doctor must know how to prevent as well as to treat the unfortunate results of chronic or acute sun exposure. He must know which diseases will be aggravated by light, and he should have something to offer the patient who is hypersensitive to the sun's rays.

Etiology of Photosensitivity Diseases

Numerous classifications of photosensitivity diseases exist. Kesten¹ presents these diseases under four headings: those forms occurring in apparently normal skin, those occurring in skin that is presumably abnormal, those appearing as a "Koebner phenomenon," and those forms occurring in skin after prolonged exposure to sunlight. This paper will deal only with diseases grouped under the first two headings. The types of reactions occurring in normal skin include solar erythema, chronic polymorphic light dermatitis, solar urticaria, and photodynamic dermatosis.

Different portions of the sun's spectrum produce different diseases. Some of the basic factors of this radiation must be understood before a particular disease can be properly evaluated. Topical therapy will be ineffectual if knowledge of the

absorption spectrum of the sun protective agent is lacking, and it does not coincide with the action spectrum. We are concerned with the sun's rays which lie between 2900Å and about 8000Å. The ultraviolet range is between 2900Å and 3900Å; visible light between 3900Å and 7700Å; and infrared extends beyond. Window glass filters out all radiation below 3200Å. Moisture does not remove erythema-producing rays, whereas dirt particles do. This explains the severe sunburns which occur on overcast days. There is considerable variation in the quantity of ultraviolet radiation transmitted at different times of the day or year. In the winter in Minnesota there is very little short wave ultraviolet in the sun's rays, but reflection from snow and water is a significant factor. The body is normally able to protect itself to some extent from sunburn radiation, because the horny layer of the skin, sweat, and melanin pigment all absorb these wave lengths. The thickening of the horny layer is the most important factor. Injury from the sun's rays occurs in the prickle cell layer so that pigment located in the basal layer is of little protective value.

The rays producing erythema or sunburn lie between 2900Å and 3170Å, with a peak at 2967Å. They constitute less than 0.2 per cent of the total sun's radiation. These rays produce the polymorphic light eruptions and most cases of solar urticaria; however, some cases of both diseases have been reported which were produced also by longer ultraviolet or visible light and one case by infrared.

In the photodynamic group of reactions it is assumed that the action spectrum is the same as the absorption spectrum of the substance producing the reactions; for example, porphyrins absorb light waves of between 4000Å and 5000Å. It is in this range that various investigators have demonstrated photosensitivity following the injection of hematoporphyrin. Most cases of phytophotodermatitis are produced by wave lengths be-

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tween 3340Å and 3660Å. When longer wave lengths are incriminated, a physical sunscreen must be used for protection. Ordinary chemical sunscreens do not absorb light waves above 3900Å, but most absorb waves below 3100Å.

Diagnosis of Photosensitivity Diseases

With the exception of solar urticaria, morphology is of relatively little help in diagnosis. The polymorphic eruptions often present a characteristic clinical picture but may simulate other dermatitides. Cases of porphyria may not always show the typical bulla; consequently, porphyria must always be ruled out in the diagnosis. A history of onset or aggravation following severe sunburn or sunlight exposure may be helpful. This may not be obvious from the history because many of these reactions are delayed. The most useful factor in diagnosis is localization. The lesions usually occur on the lateral aspects of the arms, especially the left arm due to exposure while driving a car. Other frequent sites are the pinna of the ears, the malar eminences, and the lower lip. Another useful aid in diagnosis is testing with sunlight or artificial light sources combined with glass filters. By this means it may be possible to reproduce the lesions and to delineate the range of the spectrum involved.

Polymorphic light eruptions may be simply erythema with or without edema. They may be eczematous, prurigo-like, or they may occur as chronic inflammatory plaques. In contrast to solar urticaria, there is a delayed reaction time in the polymorphic group. The lesions may resemble lupus erythematosus, but they do not scar nor is there accompanying systemic involvement. Although this form is probably on an allergic basis, passive transfer has rarely been accomplished. Epstein points out that the two diseases, solar urticaria and polymorphic light eruptions, have been seen in the same patient and are probably closely allied.²

There have been seventy cases of solar urticaria reported, but the disease is probably more common than the literature indicates. The ratio of females to males in the cases reported is three to one. This sex distribution is also true of the polymorphic light eruptions. As mentioned previously, the most common type of solar urticaria is that form caused by wave lengths under 3200Å. In these cases passive transfer has often been dem-

onstrated. The urticaria is usually localized and without pseudopods, although it may be generalized with an accompanying shock-like picture. Urticaria begins suddenly and may be associated with an underlying infection. Attacks may last a few hours to several days. In those cases caused by drug ingestion the prognosis is good after the drug is discontinued. In other cases the prognosis for a cure is poor, and the disease may persist for decades. The prognosis seems to be the worst in those forms caused by light in the violet-blue range. Hyposensitization has been achieved by gradual exposure.

The terms photodynamic (phototoxic) and photoallergic deserve some clarification. Phototoxic refers to those reactions which would occur in all persons if the amount of substance present and the amount of radiation were high enough; for example, all persons if given a sufficient quantity of sulfanilamide and an erythema dose of ultraviolet will manifest photosensitivity. Fortunately, the amount of drug required for this response is beyond the usual dosage. Photoallergic reactions by contrast will occur only in a certain few people regardless of the quantity of radiation or offending substance present. Photodynamic reactions are divided according to whether the substance is endogenous or exogenous. They may be photochemical reactions, or they may be caused by plant extracts. Many of the latter are capable of photosensitizing, especially those belonging to the pea, parsley, mulberry, and rue families. The rinds of limes are notorious offenders in southern communities. A case has been reported recently in which carrots caused photosensitivity.³

Drugs which produce photosensitivity reactions are the sulfas, barbiturates, para-aminobenzoic acid, salicylates, chlortetracycline, antihistamines, especially phenergan, chlorpromazine, and phenylbutazone. The widespread use of chlorpromazine has produced numerous cases of photosensitivity. The dermatitis in these cases is associated with a peculiar type of brawny edema. Dosage levels as low as 50 mg. per day have produced this phenomenon, and larger dosages do not produce more reactions.⁴ Reactions are produced only by wave lengths between approximately 3025Å and 2968Å.⁵ The lesions usually disappear upon cessation of the drug, and the drug may sometimes be re-administered without recurrences.

This is not the case with Phenergan, which may produce long-lasting photoallergic reactions. Since chlorpromazine and Phenergan are closely related chemically, it is understandable that they produce similar reactions.

Para-amino benzoic acid is among the drugs listed as photosensitizers. This also is the drug of choice for use as a sun screen. It has been found that the salts and esters of para-amino benzoic acid are more potent sensitizers than the acid itself. Sams⁶ has done considerable work in the field of contact photodermatitis. Of 290 such cases, lime oils accounted for 186. Forty-three were caused by perfume or toilet water, notably Shalimar. Sams also reported on reactions from two sunscreensing preparations, Skolex and Neo-A-Fil. The patients were not contact-sensitive to these creams. Both functioned as effective screens for sunburn radiation, but at the same time sensitized the skin to ultraviolet rays of longer wave length.

Of those forms of photosensitivity occurring in skin that is presumably abnormal, I shall discuss only porphyria cutanea tarda, xeroderma pigmentosum, and vitiligo. Porphyria cutanea tarda occurs most commonly in men of middle age and is often associated with diabetes, chronic alcoholism, and some hepatic abnormality. It must always be included in the differential diagnosis of photosensitivity reactions occurring on exposed areas. It is not rare since more and more cases are being discovered. Clinically, there is hyperpigmentation and hypertrichosis, and the active lesions are bullous. Often only excoriations and crusting are seen. Lesions occur most commonly on the dorsal aspects of the hands and the pinna of the ear. When there are associated abdominal and neuropsychiatric symptoms, the disease is termed mixed hepatic porphyria. Fluorescence of a specimen of urine will aid in the diagnosis. We have been unable to reproduce these lesions with the carbon arc lamp, and this has been true for the most part with other investigators in the field. Trauma may play an equally important role, but this has not been clearly established. These patients do fairly well when abstaining from alcohol and when adequate diets with vitamin supplements are prescribed. Since porphyrins absorb light waves of around 4000Å, chemical sunscreens are not effective.

Xeroderma pigmentosum is a rare hereditary

disorder beginning in childhood. The patient presents telangiectasia, pigmentation, atrophy, and keratoses, the latter terminating in carcinomas. These patients seldom survive into adult life. They must be protected from the sun. Erythema producing waves have been implicated, and sunscreens are protective. The keratoses must be carefully watched for early signs of cancer.

Vitiligo is a rather common dermatosis which is not only cosmetically disturbing but which also prevents outdoor activity without protection. In contrast to albinism, melanocytes are usually present, but they do not function. It is rare for vitiliginous areas to become pigmented spontaneously except in younger persons. Sunscreens will prevent sunburn in the affected areas, and reduce the pigmentation in the surrounding skin, making the depigmented areas less noticeable. The recent reports on the use of psoralens are probably overly optimistic; nevertheless, they offer the patient with vitiligo more than any therapy to date.

Therapy

Therapy of photosensitive dermatitides leaves much to be desired, but at times may be gratifying. If there is a photosensitizing agent involved, this should be eliminated. In those forms occurring in apparently normal skin, the best approach is gradual exposure in combination with antihistamines taken orally. The desired goal is a thickened horny layer and an increase in melanin pigment. Anything which entirely prevents this, such as zinc oxide, should be avoided. Topical preparations should protect against 10 MED's (minimal erythema doses) of sun. There are three types of sun protective medications which are used topically.⁷ The first type includes the sun screens. These are usually aromatic compounds which do not absorb light waves above 3900Å and usually absorb those below 3100Å. Para-amino benzoic acid, ortho-amino benzoic acid, and salicylates are examples of chemical sunscreens, and these are contained in most commercial preparations. They allow some erythema-producing rays to be transmitted so that tanning may occur. Second, the vehicle may also absorb some light. The third type includes sunshades or physical sunscreens, and they act by scattering light. Applied in heavy coats, they occlude all radiation. Examples of this type are zinc oxide or titanium oxide. A-Fil cream contains titanium

oxide and thus protects against the longer wave lengths. The sunshades must be used either alone or in combination with chemical sunscreens in the photo-dynamic group of eruptions and anywhere else when longer wave lengths precipitate the reaction. Desirable points to consider in the choice of topical preparations are as follows: they should absorb most but not all radiation below 2900Å; nevertheless, chloroquine seems to be genic, stable, and should not discolor. They should stay on for several hours, be cosmetically acceptable, and relatively cheap. Men will use the colored creams, but women prefer the alcoholic lotions. Antihistamines applied topically absorb the proper rays, but they are sensitizers and should be avoided. The preparation of choice is 15 per cent para-amino benzoic acid in a water-washable ointment base or in a lotion. There are several commercial preparations available which protect against 10 MED's of sun.

Certain internal factors deserve attention. It is important to eliminate underlying infections. Diet directed toward protecting the liver is indicated not only in porphyria but also in other photosensitive diseases. Abnormal liver function is often found in the latter. Lamb recommends hormonal therapy for severe cases of polymorphic light eruptions.⁸

Antihistamines taken orally have been shown to produce some increase in tolerance to the sun. They are of use in solar urticaria, as well as early in the season during the stage of gradual exposure. It is well to remember that they may act as photosensitizers in some persons.

Antimalarials are a relatively new addition to the pharmacologic armamentarium in these diseases. Chloroquine absorbs light waves of around 3400Å, and atabrine absorbs those of around 2900Å; nevertheless, chloroquine seems to be the drug of choice. In a recent study plaquenil sulfate appeared to be as effective as chloroquine, and there was a lower incidence of side effects.⁹ Liver damage is a contraindication to the use of these drugs. Experimentally, chloroquine does not decrease the erythemogenic response, but clinically it reduces the abnormal papular reaction in the polymorphic light eruptions.¹⁰ Epstein has quoted good results in solar urticaria.

Finally, mention must be made of the psoralen compounds. These drugs come from the fruit of the *Ammi majus* Linn plant. The most active

principle is 8-methoxy psoralen. It absorbs wave lengths between 2200Å and 3500Å. Taken orally, it is said to increase melanogenesis and to increase tolerance to ultraviolet rays. The latter is a moot point. Fitzpatrick believes that it increases all cutaneous responses. Topically, it decreases tolerance to the sun, and erythema and vesiculation occur if exposures are not gradual. It is relatively nontoxic, but it should not be used in the presence of liver damage. Fair results have been reported in patients with vitiligo who were maintained on the drug for at least four months.¹¹ It must be combined with exposure to ultraviolet rays, and the sun itself is apparently superior to any artificial source.

Summary

A discussion of the etiology and diagnosis of photosensitivity diseases is presented. A therapeutic approach is outlined which includes (1) topical applications and (2) internal measures with (a) antihistamines, (b) antimalarials, and (c) the psoralen compounds.

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Treatment of Tuberculosis Today

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THE United States Public Health Service reports that there are currently about 400,000 active cases of tuberculosis in the United States at any one time, about one third of which are hospitalized, one third are known cases at home, and one third are undetected cases. The physician in general practice has a responsibility to each of these groups. It is to him that the patient often comes for diagnosis, and returns for post-sanatorium follow-up. For the patient who cannot or will not be hospitalized, he must prescribe and administer treatment, and he must be ever watchful for the undetected case, so that it too can be isolated and treated.

Unfortunately, tuberculosis remains a chronic, infectious disease in spite of our best efforts to combat it, but the past ten years have brought tremendous changes. Ten years ago, we discussed the type and duration of collapse therapy, and measured our success or failure by mortality rates. Now, we confer on the type and duration of drug therapy, the time and extent of resectional pulmonary surgery, and the spotlight has shifted to morbidity rates.

The number of deaths from tuberculosis has decreased between 15 and 20 per cent each year for the past few years; the latest figures for the United States are 9.4 per 100,000 in 1955, and for Minnesota 4.0. However, the number of new cases reported has decreased only about 3 per cent per year for the past five years.

Considering these rapid strides, what is accepted as adequate tuberculosis treatment today? First of all, bed rest is still basic. To get the patient to relax mentally and physically is a constant, time-consuming task. There are at least three theories to explain the effectiveness of bed rest, according to Mitchell:

1. Reduction in metabolism. Reduction in activity reduces the oxygen requirement and hence, the amount of breathing.

2. Alteration in pulmonary circulation. Because the systolic blood pressure in the right ventricle is only 20 per cent of that in the systemic circulation, it has been reasoned that the pulmonary circulation in the apices of the lungs in the vertical position is relatively reduced. The resultant increase in oxygen and decrease in carbon dioxide in the apical alveoli produces a medium favorable for the multiplication of tubercle bacilli.

3. Reduction in the lung volume. In the horizontal position, there is a reduction of lung volume from 10 to 40 per cent, producing a mild bilateral collapse caused by the rise in diaphragm. It goes without saying that bed rest is most effective in the acute and/or the progressive case. It is least effective in the chronic case.

The psychological effect of bed rest is important. It helps to make the patient and his family understand that he is ill and needs treatment. With hospitalized patients, it helps to keep them in the hospital. The patient always has a tendency to take more activity than is prescribed, and recalcitrant behavior more often occurs among ambulatory patients.

Most authorities agree that a period of hospital care is still necessary for the active adult case of tuberculosis. He will learn the physical facts about his disease; for instance, that it is a generalized disease with local manifestations, and that it takes a long time for the average case to become inactive. Contagious technique can be taught to both the patient and his family. He will learn how to cover his cough at all times, how to dispose of his sputum; he will learn the importance of systematic rest and the avoidance of worry and fatigue. The patient can be better followed as to the tolerance of drugs and the improvement in his disease. This is especially true in the matter of x-rays and bacteriology. The patient will also learn the tremendous importance of uninterrupted drug therapy. His physician will have a better opportunity to judge the proper time for surgery, if it is indicated.

In the hospital, the patient will also have the benefit of occupational therapy, schooling, re-

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habilitation and the assistance of the medical social worker in solving the personal problems of a long-term illness.

It could be argued that in a few types of recently diagnosed tuberculous cases, the patient could be treated at home. The active, primary tuberculosis patient has done well at home. The pleural effusion patient, and the clinical, silent, minimal patient may be treated thus, if he is co-operative, and has a good emotional and mental make-up so that he can, and will, follow instructions as to the cure. Much depends on whether the home conditions are such that the patient can be isolated and allowed to rest.

With rest, anti-microbial drugs are given, and these are now known to be very effective. We have a number of such drugs. They are all bacteriostatic, and are given to all patients with active tuberculosis. With them, we obtain a favorable effect on the reversible component of the disease process. Thus, best results are obtained in treating those patients who have recently developed lesions. The principal drugs in use are:

1. *Streptomycin*.—This drug was the first to show potent effects as an anti-tuberculous drug. It is given intramuscularly, generally one gram twice a week. It does have toxic side effects, such as skin eruptions, fever, headaches. It may also have toxic effects on the vestibular portion of the 8th cranial nerve, resulting in dizziness.

2. *Isoniazid (INH)*.—This drug is given by mouth. It is well tolerated. The dose is 100 to 200 mg. twice daily. This drug may produce peripheral neuritis. In older people, the use of 25 mg. of Pyridoxine daily may prevent peripheral neuritis.

3. *Para-amino-salicylic acid (PAS)*.—This drug is usually given by mouth, the preferred dose being 12 grams daily. It is a bad tasting drug, not as effective as streptomycin or isoniazid, but is very useful combined with streptomycin or INH. Either of these combinations delays markedly the emergence of resistance of the tubercle bacilli to these drugs.

4. *Viomycin*.—This is given intramuscularly. Its anti-tuberculous action is much like streptomycin, and it is usually used as a substitute for streptomycin. The dose is 1 gram twice daily, twice a week.

5. *Pyrazinamide (PZA)*.—This drug is given by mouth, 1½ grams to 2½ grams daily. It is somewhat toxic to the liver, so that liver function tests must be performed routinely. This drug is very effective when given with isoniazid. It must be emphasized that these drugs should be used in combination, and there is no advantage in using more than two drugs at a time, except when treating miliary tuberculosis or tuberculous meningitis. For these types of tuberculosis, the preferred treatment is streptomycin grams 1 daily, PAS grams 12 daily, isoniazid 200 mg. twice daily, until the acute phase has subsided.

The tremendous value of the drugs in reducing the toxicity of the patient, in reversing the progressive nature of the disease, in eliminating the symptoms and signs of tuberculosis, and in speeding up the active healing of the lesion, has produced a tendency among tuberculosis workers to relax contagious technique. But it must be remembered that the drugs do not sterilize the lesion, and for the open positive case, it generally takes two to three months before they are really rendered negative.

Emergence of resistance to the drugs used will be found sooner or later in the open cavitory case where we cannot convert the sputum to negative. Drug resistance is suspected when the patient complains that he is not feeling as well as he has been, or that he is raising more sputum, or when the x-ray does not show the expected improvement. Testing of cultures for resistance should be carried out routinely. Complete resistance should lead to consideration of surgery to close the supposedly open cavity, and a change to another drug regimen is indicated.

Interruption in drug therapy hastens the emergence of resistance very much. Because of this, the patient must be impressed with the idea of taking the drug even if its taste is bad, or abdominal symptoms and complaints arise. The duration of drug therapy should be from eighteen to twenty-four months when streptomycin, PAS, isoniazid in any combination of two are used, and this applies where they have been effective in converting the patient to negative. Many patients are sent home while still on drug therapy, but continue its use while on limited activity or occasionally on full activity.

Resection surgery has replaced collapse surgery. It may mean taking out a small piece of lung tissue, or it may mean taking out as much as one

complete lung. The improvement in anesthesiology and in chest surgery has made these procedures very safe, and we believe, very effective in rendering the patient inactive, and in preventing relapse. The mortality figures depend on the type of case, but are quoted as 1.2 to 10 per cent. The complication rate is low when the patient is fully prepared for surgery, and has been well covered with effective drugs.

The timing of surgery is very important. The treatment of the average case is well defined, but differences of opinion may arise with a far advanced case with cavitation, and also with the minimal case which has some residual disease. Indication for the resection of the residual cavity or caseous nodules of 1 cm. in diameter or more is now widely accepted, and is also indicated for tuberculous bronchiectasis, atelectasis, and/or extensive damage of a segment, a lobe, or a complete lung, especially if the patient has positive sputum. This is especially true of the younger patient who has a good vital capacity, and who has much to look forward to, if he can become classified as inactive. The older patient, who has an impairment of the heart or vascular condition, or a lung condition such as emphysema, may be treated without surgery.

After surgery, the average patient continues the cure, because only the gross disease has been removed. There are still foci in the lung and glands that need treatment. The length of time in bed after surgery depends on the extent of the disease, the extent of the surgery, and the activity of the lesion removed by surgery. The average patient stays in bed four months after surgery and is then ambulated.

During the postoperative and ambulatory period rehabilitation plans are fully developed. At the time of discharge, the patient must be impressed with (1) the necessity of continuing with uninterrupted drug therapy; (2) the necessity of periodic check-ups, especially x-rays and blood studies every three months for the first year and every six months thereafter; (3) the need for starting schooling or work part-time, gradually increasing to full-time.

Since about half of the known patients with tuberculosis are being treated outside the hospital, the Public Health Service has shown particular concern for this group, and has made a detailed study recently. It shows that community facilities such as clinics, public health nursing and social

service are found in most urban areas, but almost half of the rural areas studied have no clinics, 10 per cent have no public health nursing service, and 80 per cent have no social services outside of the financial assistance provided by departments of public welfare. The study also emphasized that local health departments should be particularly concerned about the spread of tuberculosis, because of the presence of active cases in the community. With present-day treatment so clearly defined, the non-hospitalized patient should have the benefit of every facility offered to the hospitalized patient, though this is often harder to achieve on an individual basis and more expensive than where it is concentrated within the hospital.

The person who has an undetected case of tuberculosis is potentially the greatest menace, and constant vigilance in case finding is the only answer. It is now agreed that mass chest surveys alone will not lead to eradication of tuberculosis, but a continuing survey in the doctor's office will capture one third of the population, since that is the number who see their physicians in a year. The x-raying of hospital admitted patients has proved to be effective, since the number of cases found are two to four times as high in this group as in community surveys. The diagnostic studies and proper disposition of the case become the mutual responsibility of the attending physician and the local health department. The tact and understanding with which this initial situation is handled often determines the patient's future willingness to cooperate in the matter of isolation, hospitalization and treatment.

In conclusion, I would like to quote from the statement by the Committee on Therapy of the American Trudeau Society, which says:

"From the facts now available, there is no evidence to support a reduction in the amount of rest therapy from that of past practices, except as this may be justified by an earlier attainment of an inactive status of the disease . . . the total period of disability, although greatly shortened on the average with drug therapy must still be estimated at a minimum of one year. Every person with potential infectious tuberculosis should be in a hospital bed."

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Counseling Parents of Gifted Children

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TO COUNSEL gifted children, we must first find them. To identify them, we must know for what to look. After we know this, we must learn *how* to look for them—what methods and instruments of identification we can use. After we have identified them, we must know how to help them develop their potentialities. Counseling is only part of this process.

The counselor has four main functions: (1) To work with and through school teachers; (2) to counsel with individual students and parents; (3) to suggest changes in the school policies and environment in light of the needs of the gifted students; and (4) to discover and use community resources for the best development of the gifted. In the past, counselors have spent much of their time interviewing students and parents and have neglected these three other very important functions through which they can greatly extend their influence.

Counselors can help teachers identify gifted students. For example, in the Long Beach, California, school system counselors in each school systematically went through the pupil personnel records to identify students with IQs over 120 and others who showed some special talent. They called in these students, together with their parents when possible, for a conference. In this conference, they discussed the student's potentialities in relation to educational and vocational opportunities. After the conference, the counselor sent a memorandum to the student's teachers suggesting things they could do to enrich his program. The result of these conferences was to increase the student's sense of responsibility for his gifts and to alert parents and teachers to school and community opportunities for their development. Thus the counselors aid in the identification of gifted students; they help the gifted individual to understand himself and get the experiences he needs in the school and community. They help

the parent to avoid the extremes of exploiting their gifted children or of denying them the education and encouragement they need. And their concrete suggestions help teachers to meet the needs of gifted students in their classes.

There are three main ways of identifying gifted children: (1) Through their cumulative personnel records; (2) through the results of intelligence and achievement tests; and (3) through teachers' observation of them day by day.

The percentage of intellectually gifted will vary from school to school. In one school district 4 per cent of the students scored 125 IQ or higher on standardized intelligence tests; in another school district there were 29 per cent on this level.

The central task of counseling the gifted is to help them understand themselves and feel a sense of social responsibility for their lucky combination of heredity and early childhood experiences.

With young children, guidance in their daily activities is most effective; this is guidance while teaching. Adolescents welcome the opportunity to appraise themselves. They want the counselor to interpret the results of tests and to help them develop a realistic concept of the kind of person they can become. The counselor should help them to see that the world needs them; to think through what may be blocking them; to understand their parents—perceive them in a different light; to distinguish between conditions they can change and conditions that they have to accept at present.

It is very important for the counselor to try to see situations from the child's and the adolescent's viewpoint and to try to understand how they feel. In the panel discussion by gifted youngsters, we obtained a glimpse into their world. They gave us clues as to why some bright students fail in one or more subjects, the kind of teachers they would like to have—teachers who are interested in every student and take time to know them as individuals; who enrich the class work and give all a chance to participate; who know what each student can be expected to do, and provide a program geared to their talents. These

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youngsters are usually eager to learn; they are bored and dissatisfied with dull books and poor teaching. But they also show sympathy for and understanding of the heavy load that counselors and teachers carry. Gifted young people speak with clarity, directness, and vividness. We should listen more to what they say. We can learn much from them.

In counseling parents, too, it is important to help them see things through their children's eyes. It is also important, through very skillful counseling, to help parents understand their own feelings and why they behave as they do toward their gifted children. Parents have many attitudes toward their gifted children:

1. *Parental Attitude of "Whatness" rather than "Whoness,"* as the late Dr. Plant expressed it, concerns primarily their child's achievement and that the child be a credit to them and increase their prestige. Some gifted children sense that they are not loved for themselves, and resent this, even to the extent of sometimes failing in school.

2. *Parental Attitude of Jealousy* toward the gifted child; as such, some parents "can't take" the child's superiority to them; it makes them feel inferior.

3. *Parental Attitude of Hostility.* Sometimes, just because the child reminds the parent of someone whom he hates, the original emotion is reintegrated.

4. *Parental Attitude of Indifference.* Parents are too busy, the child does not have a supporting relationship and may feel that what he accom-

plishes doesn't matter, because no one really cares what happens to him.

5. *Parental Attitude of Possessiveness.* Some parents take credit for their child's achievement and try to absorb the child and keep him dependent.

6. *Parental Attitude of Boasting.* Some parents embarrass the child by making him seem different from his friends.

7. *Parental Exploitation of the Child.* Some parents force him to practice long hours, exhibit him and forget that "though he is gifted, he is still a child."

In counseling parents, the counselor should help the parent to realize the importance of the first years of life and the security and freedom to explore that comes with being loved. Dorothy Barclay summed it up by saying, "Lead the good life and love that baby." Through preschool years, the parent can help the child most by providing a "lush environment"—material, equipment, affectionate relations—letting him take the initiative in using this environment, and giving encouragement and approval for his genuine successes.

In counseling both parents and children, it is most important "to inspire them to effort." Dr. Albert Schweitzer has expressed this as follows:

"Whatever you have received more than others in health, in talents, in ability, in success, in a pleasant childhood, in harmonious conditions of home life, all this you must not take to yourself as a matter of course. You must pay a price for it. You must render in return an unusually great sacrifice of your life for other life."

TREATMENT OF TUBERCULOSIS TODAY

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Editorials

JOHN F. BRIGGS, M.D.
ARTHUR H. WELLS, M.D.
HENRY G. MOEHRING, M.D.

THE ADVANTAGES OF PRIVATE MEDICAL CARE

"May the love for my art actuate me at all times; may neither avarice, nor miserliness, nor thirst for glory, nor for a great reputation engage my mind; for the enemies of Truth and Philanthropy could easily deceive me and make me forgetful of my lofty aim of doing good to Thy children."—*Daily Prayer of a Physician* by MAIMONIDES

The art of medicine is the Great Art. Its practitioners are dedicated; its appreciators are fervent. Surely, it is the wish of all thinking, discerning men that members of the medical profession know an atmosphere which will enable them to maintain the high quality of health care that they are giving Americans at the present time. That atmosphere is one which is free from government control or intrusion. American medical men possess this freedom now, and they must continue to possess it.

A look at the advancements in the health standards of the American people will readily show us just what has been accomplished by doctors operating under this private practice system.

Since the founding of our nation, life expectancy has increased thirty-nine years. Contributing factors lie in all fields of medicine. Since 1900, the death rate has increased for eight diseases, while it has decreased for twenty-one diseases. The increase is due to the fact that, since that year, the population of America has doubled. For every 1,000 babies born in 1957, some 130 live who would have died fifty years ago. The number of people over sixty-five has quadrupled, and these people account for the marked rise in the death rates for cardiovascular diseases, cancer, and other diseases of old age. The decrease is due to the discovery and perfecting of antibiotics, improved surgical methods, quicker diagnosis and reporting, and to the work done in the field of preventive medicine.

This editorial was the prize-winning essay in the 1957 Essay Contest for High School Students sponsored by the Association of American Physicians and Surgeons Freedom Programs in cooperation with the Minnesota State Medical Association. The author was a Senior student in the Olivia, Minnesota, high school at the time of writing.

Such splendid achievements could not arise from a profession with low standards of quality. The medical profession requires of its prospective members ten years of advanced education in any of the nation's eighty-two approved medical schools and under intern and residency programs. Post-graduate courses are offered by schools, societies, hospitals, and other health agencies. Standards are elevated in auxiliary fields of medicine, such as laboratory technology and occupational therapy. Financial aid can be secured by deserving medical students. A record number—7,686—entered medical schools in the 1955-56 academic year. What may appear to be, in some areas, a shortage of doctors, in actuality is maldistribution. This is being remedied by placement programs which inform communities of doctors desiring locations and informing doctors of communities desiring medical care.

One of the arguments for socialization of medicine frequently used by uninformed people is this: "If the government takes control of medicine, we'll get free medical care." Medical care, like every other necessity, costs money. There is no reason why anyone should hesitate to go into debt to meet medical costs. There are three ways that a man can pay for medical care:

1. *Cash*.—It is cheaper to pay for home or office calls than to pay taxes to the government on the chance that one might need this kind of service.

2. *Savings, securities, loans*.—Should a man find it necessary to delve into his savings to pay a medical bill, he can do so. If this is not necessary, the savings will remain on hand to meet other types of expenses that may arise. If medical bills were met with federal taxes which, in this case, are compulsory savings, a man could not use these funds for any purpose other than to meet medical expenses.

3. *Commercial insurance*.—In exchange for premiums, one is paid for the costs of more serious illnesses and operations. The uncertainty of a large expenditure is replaced by the certainty of

small one. The advantage of voluntary health insurance over compulsory health insurance is this: The individual reserves the right to select his own doctor and hospital. At the present time, over 60 per cent of the estimated eligible population carries some type of voluntary hospital expense coverage, and approximately 50 per cent is protected against some of the insurable costs of surgery. The voluntary health insurance movement has already surpassed the goals originally charted by the pioneers in this field. It has been on a voluntary basis that all great progress in America has been achieved, and only on that basis can the nation be assured of progress in this field.

A look at the country of England will show some of the dire results of the socialization of medicine. Under the National Health Program, that country proposed to give the indigent, the poor, the average, and the wealthy the same quality and quantity of medical care, and maintain the quality and quantity that the wealthy were accustomed to under private practice. What happened? In London, wealthier districts have an average of one doctor for 1,261 patients, and poorer districts have twice as many patients per doctor. The farming and mining communities suffer even more from lack of medical services. In February of this year, the British Medical Association advised 21,000 English general practitioners seeking a pay raise to quit Britain's socialized system of medicine. The Association recommended the adoption of a pay-as-you-go plan.

From bitter experience, Britain has learned some of the inevitable results of government medicine. (1) Administrative costs of collecting the taxes and redistributing them as sicknesses occur make the entire program less than worthwhile. (2) The physician-patient relationship, always confidential, has been disturbed by this third party intruder, the government. (3) Physicians lose autonomy in diagnosis and treatment that they possess in private practice. (4) Political influences enter into the sphere of medicine. (5) Regimentation occurs in conditions of employment for doctors: the number of hours they must work, their income, and their location. (6) Standardizing the treatment of patients slows down research.

Should anyone feel that the indigent and the chronically ill are being neglected under America's present system of medicine, let us investigate these areas. The chronically ill, of course, are ex-

cluded from private medical plans because the risk is too great. However, in this country there are private institutions that give considerable amounts of aid to the aged, the sick, and the handicapped. Doctors often treat these people at reduced costs. Indigent people are those who can neither afford medical care nor the other necessities of life. They are supported by welfare programs, and are the only people who should receive government aid. If the government stepped in to furnish all of us with medical care, all private resources would dry up, and the taxpayer would have to shoulder the entire load. The government already takes one-third of our income, so why make it necessary for it to take more, when private medicine is less expensive and so much more efficient? Let us not forget that it is the intrinsic nature of bureaucracies to get bigger and bigger, more and more wasteful, costlier and costlier and, at the same time, to get further and further out of touch with the individual and his or her particular needs.

In 1939, in a small country town, a woman was stricken with simultaneous influenza and pneumonia. For several days, her life hung by a thread, and during these days her family doctor was unfailing in his efforts to strengthen that thread. It was a personal matter with him; a battle in which he pitted himself against death itself. In the late hours of the night and the small hours of the morning, he was available to administer stimulants when it seemed the thread could hold no longer. As a last resort, this country doctor sent to a larger city for a new drug that had just appeared on the medical scene and about which, through his constant studying, he had just learned. This forerunner of the "miracle" drugs—sulfanilamide—along with the doctor's dedicated care, saved the woman's life.

Picture this same case under socialized medicine. During the day, the doctor would have been too harrassed by petty rules and regulations of diagnosis and treatment to give his undivided attention to the saving of this life. After hours, when stimulants were needed immediately, the "night doctor" would have to be called. In all likelihood, there would have been no case-continuity nor any of the vitally important feeling for the patient on the part of the "night doctor" working his "shift." When the new drug was wanted, there would have been red tape to cut, and forms

and requisitions to fill out. By the time the drug would have arrived, the thread of life would have been completely and finally severed.

When I see this woman now, eighteen years after her illness, a gracious old lady bringing joy to all those around her, it seems to me that she is a living embodiment of the advantages of private medical care.

SONIA GUSTAVSON

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TAUTOLOGY OF FARROT

The tautology of Farrot is an old disease that has been with us for a long time. Various authors and writers have described this or that facet and phase of it, but no one has described its tenacious, stubborn tendency to recur intermittently among physicians. Farrot*, himself, first described it as a malady afflicting Continental politicians—and, in fact, it is indeed endemic among politicians, without apparent geographic restrictions.

Despite Farrot's probable priority in being the first to describe this condition, we can well afford to eliminate his proper name as an eponym for most of the subsequent discussion which follows. Perhaps the briefest and most succinct (and therefore to be eyed askance) definition of tautology is the dictionary's: "Needless repetition of meaning in other words . . . an instance of this . . . 'audible to the ear'." This disorder commonly takes subtler forms that are less obvious when it appears amongst physicians.

*Farrot, Muguet deC.: *La tautologie étouffante chez les politiciens malhonnêtes*. *Allgemeine Monatschrift generale de Philologie*, 10:vi-xii (Winter Issue) 1921-2.

In its average, run-of-the-mill form, tautology of Farrot in physicians might show itself as:

"Her temperature showed a brief, transient elevation."

"He first showed splenomegaly or enlargement of the spleen last year."

"Oftentimes the patient has no warning . . ."

The more flagrant, but still benign forms manifest such presenting symptoms as:

"He died of a fatal peritonitis."

"We found he had hepatic cirrhosis of the liver . . ."

"A contributory cause was arteriosclerosis of the vessels . . ."

As one can easily picture, the mature forms when the disease is fully developed, can be malignant (the clinical laboratory may adduce corroborative evidence in the form of a higher titer of verboojuice than of technical waffle). We wait with hair-bleaching expectancy for a report of full-blown tautology of Farrot in a physician who ends his talk at staff meeting with:

"We are confident that we should surely have foreseen in advance that we would retrogress backward . . ."

H.G.M.

DOCTOR MYERS RETIRES

After forty-two years of distinguished service to the University of Minnesota, Dr. J. Arthur Myers has reached the age of compulsory retirement from academic service and responsibilities. Few persons can point to so long a span of academic appointment and none can claim a more notable record of teaching and professional leadership.

As a teacher, Doctor Myers has been a true friend and inspiration to thousands of students and colleagues. From all corners of the globe, they have come to benefit from his counsel and to partake of the wisdom and experience that he has so generously shared with them. Visitors to the University have beaten a steady path to his door where a cordial welcome was always assured.

But it was not alone as a teacher that Doctor Myers has made his imprint on medicine and on Minnesota. As an independent investigator of the epidemiological aspects of tuberculosis, he has developed concepts which, though bitterly challenged at their inception, have become increasingly accepted as the tuberculosis death rate has declined. A leader in the tuberculosis control pro-

ram in Minnesota, no one has contributed more to the state's enviable record. As the editor of two medical journals and author of several books and of innumerable scientific papers, Doctor Myers has occupied an almost unique position in the field of medical writing and journalism. The light burning in his University office far into the night when other areas were in darkness has given mute testimony to his devotion to these tasks. More local is the praise of patients he has seen in his private office or as consultant to the Student Health Service at the University.

Although Doctor Myers is retiring from the University which he has served so long and so faithfully, he is fortunately not retiring from either academic or professional leadership. As professor emeritus, medical editor, investigator and clinician, his work and his influence will continue. Minnesota owes him a great debt of gratitude for the contributions he has made to its welfare and is fortunate that his academic retirement will only give him more time to devote to his many other medical interests.

G.W.A.

CONFESSIONS OF A HOBBYIST

Botanizing

When I was in high school, some fifty years ago, I became interested in identifying wild-flowers, and was encouraged by one of my teachers. He was a very dull Latin teacher, but he had been a pupil of the great botanist, Asa Gray. He knew the plants and the trees, the grasses, sedges, mosses and lichens. When I last saw him, five years ago, he was 102, but as clear-headed as ever, and he presented me with two rare books on mosses. It was he who encouraged me to make an herbarium, and I must have done rather a good job, because, not long ago, the University of Minnesota was glad to get the collection, made in 1900.

Once one becomes conscious of plant growth, there is no boredom any where—even on a dump-heap. Interesting things grow everywhere. I am not a qualified botanist, but I have acquired some knowledge of the characteristics of the various families, and I have had infinite pleasure in seeking and identifying wild plants. For about thirty-five years, I did little active botanizing, and then I was at it again, here in Minnesota. I did some

collecting for the University in Cook County, and found there, among other things, an orchid, *Arethusa*, almost unknown in this state. But pressing and mounting specimens no longer appealed, and color photography gave me the idea of photographing flowers in their natural habitat. A very difficult kind of photography, as I soon discovered, but fascinating. The result has been about 1100 color slides, and from some of the best of these, color prints, of which more later, when I write of photography. Like most amateurs, I was particularly interested in the Orchidaceae, and my collection includes fine photographs of the six *Cypripedia* (Moccasin Flower) that grow in Minnesota. I soon discovered that most of the beautifully illustrated "wild flower books" list only things that are easily identified, and turned to the technicalities of Gray's Manual and Britton and Brown for identifications of less conspicuous plants.

Botanizing is, perhaps, the best hobby of all, because it combines so many things—exploration, photography, a bit of fishing on the side, and the best of outdoors. Mrs. Briggs, who has become as great an enthusiast as I am, and I have prowled all through the National Forest in northern Minnesota, by canoe and on foot. We've penetrated swamps, some of them dangerous, because a swamp may be a botanical treasure-trove. We know the flora of Minnesota and New England pretty well now. Our photographs have been taken in floating bogs in the north, in Minnesota river-bottoms, in the alley behind our house, and in all sorts of unexpected places.

JOHN DEQ. BRIGGS

CALENDAR HISTORY

After the demise of Franklin's almanac in 1757, others sprang up to furnish the early American businessmen and homes with calendars. These ventures continued on until the late 1880's, and some are still being published.

It was during the 19th century that advertising business calendars had their first feeble introduction to the American way of life. Early in the century, almanacs carried advertising, or at least the name of the publisher. In 1836, one published in New York carried an advertisement for pills, and others soon afterward put in a "plug" for vegetable powders and syrups. Vari-

ous New York publications prior to the Civil War added pages of advertising to their annual almanacs, and it looked as if business had at last gotten its foot in the door with calendar advertising, for medicines, cough cures and similar products.

In the 1850's and '60's, a single-sheet business calendar began to appear. These were put out carrying the name of printers, lithographers, engravers and newspaper publishers.

The birth of a calendar as a truly advertising medium for a businessman other than those in the printing or allied fields sprang from the necessity of a couple of broke but resourceful newspaper publishers.

Edmond B. Osborne and Thomas D. Murphy were college chums in the 1880's. Partners after graduation in operating a weekly paper at Red Oak, Iowa, the young men wanted to run a picture in their publication of a projected new courthouse. Unable to pay for a wood cut, since this would use up the entire week's revenue from their paper, Osborne hit on the idea of paying for the cut. He outlined to his partner a plan for printing a wall calendar, surrounding it with advertising of local merchants. About twenty-five businessmen went for the idea, and the young advertising calendar pioneers netted \$300 on the deal. They put out 1,000 calendars.

Their first salesman was Herbert Huse Bigelow, the man who founded the largest calendar house in the world. He teamed up with a printer, Hiram Brown, in 1896 to start the firm of Brown & Bigelow in Saint Paul. Brown left the firm shortly after its organization. Bigelow pumped life into the partnership through emphasis on quality, and after three years enlarged quarters were necessary.

In 1903, the first full-color calendar reproductions were offered customers in a subject called "Luscious Fruit." In 1904, the firm followed with the famous girl subject, "Cosette," which proved a fast-selling item for many years and gave an early forecast of the value of a pretty girl on any type of advertising.

Introduced in these early years were items such as horse covers, cloth caps, pancake turners, fly swatters, watch fobs and similar popular merchandise.

JOSEPH H. SUMMERS

Brown & Bigelow

THE SIZE AND MATERIAL OF BOOKPLATES

In the first article of this series, the antiquity of the bookplate was outlined; in the second, the customs of collecting and exhibiting; in the third, the famous depositories. As to the size of a bookplate, personal choices vary. Some are as small as a postage stamp, the average size being two by three inches. Some are of thin leather, stamped with gold leaf. These are often oval or round and small, from an inch to an inch and a quarter high.

The material of which bookplates are made may vary. It may be a non-curling white paper with a smooth surface and gummed back, or a Japanese vellum, or it may be almost any paper which takes the printing well and which interests the owner. If a gummed paper is used, be sure the quality is excellent. It is not possible to get the more unusual papers already gummed, and it is not satisfactory to have the printer try to gum them and allow them to dry. This curls the paper and often spoils the prints, if they are from a steel engraving, for example. A bookplate is a strong influence to endear to a child its own small library as nothing else can, and even a child can enter a bookplate printed on simple gummed paper. Just help him to get it in straight, for this is one of the rules. It is to go inside the stiff cover, always; at its center, or in one of the corners.

Various methods of making the plate are employed, sometimes lithography, excellent wood-cuts and even linoleum blocks. There are three processes which I am accustomed to use as a designer: zinc etchings, copper plates, and steel engravings. As soon as the metal plate is finished, almost any number of impressions can be taken, from any kind of plate.

The plate by the simplest of these three processes is a zinc etching. This is made from a black and white drawing in ink, black waterproof ink being used, the design being preferably three or four times the size it is to be in the finished plate. The cardboard with the best surface for the drawing is Doeskin. Ten dollars ought to cover the cost of a zinc etching, which is made by a photo-engraver in any city. This plate is mounted on wood. Any printer who uses type can print from this plate. His bill ought not to exceed five dollars

Fourth in a series of editorials on bookplates.

any quantity up to 200. To this, one must add the cost of the paper which will probably be from a dollar up, depending on the kind of paper chosen, perhaps hand made from Sweden, Holland, England, Italy or the Orient.

The second process is a thin copper plate. The engraver cuts directly on the metal with a graver, and a black and white drawing is reproduced on the copper by the photogravure process, known also as intaglio, which is handled only in certain parts of our country. In either event, the process of printing is the same. The material is dampened and allowed to lie between blotters over night. Then the prints are made separately by hand. If more than a few copies are to be made from this plate, it is necessary to have a steel coating floated on the surface. This does not fill in the lines which hold the ink, nor render the plate less effective. In a few cities, there are now specialists who print with paper dry, and by power press, from photogravure plates.

The cost of the plate, if cut by hand by the engraver, depends upon the charges usually asked by that person for his own etchings. If done by the photogravure process, the cost of the plate and its steel facing will be about \$75.00, as compared with the \$10.00 charge for the zinc etching. After the plate is made, the cost of prints is approximately \$15.00 a hundred, including stock, if they are two by three inches, even three by four inches, in size, and are printed from this intaglio or photogravure plate.

CLEORA WHEELER
Designer and Illuminator

ELECTIVE INDUCTION OF LABOR

(Continued from Page 624)

same in both induced and spontaneous deliveries; however, we had only about one-fourth as many stillbirths in those patients induced as in those allowed to go into labor spontaneously.

8. Our stillborn rate and our neonatal death rate was about one-half of the average rates in the State of Minnesota. This might be due to lessening of cases of postmaturity, which is ranked second only to prematurity by some authors as a cause of fetal and neonatal mortality.

9. Though the series presented may be too small to be of great significance, in our experi-

ence induction of labor had no effect upon maternal morbidity.

Conclusions

If certain rigid criteria are fulfilled, in our experience, elective induction of labor shortens the labor and is a safe procedure for the mother and safer for the fetus. There are many other advantages. The patient and her family can prepare for the event. She is scheduled and admitted to the hospital at a time when it is most desirable from the standpoint of hospital administration. We believe elective induction of labor properly carried out, can no longer be classified as radical obstetrics.

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DIFFERENTIAL POINTS IN THE PROBLEM OF HEADACHE

(Continued from Page 638)

reliable early symptom, and a few patients may experience visual loss before the headache takes them to the doctor.

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OLD AGE PENSIONERS

Lone women apparently are able to fend for themselves much better than men, Dr. R. C. F. Smith concludes from a study of 1,000 old age pensioners in North-east England. There were 500 men and 500 women included in the study who varied in age from 62 to 97 years. Melancholia was almost exclusively a male finding and almost always due to the death of the partner.—*Foreign Letters, J.A.M.A.*, July 20, 1957.

President's Letter

THE AMERICAN MEDICAL EDUCATION FOUNDATION

In 1951, as one means of resisting pressures for government financial aid to medical schools, the American Medical Education Foundation was created. The function of this Foundation is to solicit and distribute funds to medical schools of the United States for teaching and research facilities. As a companion to this organization, there was created the National Fund for Medical Education. Physicians were accorded the privilege of contributing to the former. Funds for the latter came from many sources, primarily from industry and from other foundations.

In 1951, when the American Medical Education Foundation was created, it was felt that the funds of the Foundation would serve as a stimulus to additional contributions from all sources, and so the funds were disbursed through the National Fund for Medical Education. Until 1955, the funds from the American Medical Education Foundation totaled more than half of the amount donated to the schools by the National Fund for Medical Education. Now the funds accruing from other sources have gradually increased, so that the need for the stimulus provided by the Foundation funds no longer exists.

Hence, in 1956, a separate listing and mode of donation of moneys was devised and put into action; the objective was to stimulate physicians to contribute more funds to their own organizations than they might be inclined to do if the contributed funds continued to be received and disbursed by some other organization with which physicians had no intimate association or acquaintance. That is to say, better relationships can be established with contributions by alumni. The American Medical Education Foundation accepts contributions designated for a particular school; the National Fund for Medical Education does not.

The directors of the American Medical Education Foundation, ably led by Dr. Louis H. Bauer, feel that the present direct system of distributing funds will, in the long run, be of greater benefit to the medical schools, and that both the American Medical Education Foundation and the National Fund for Medical Education will be able to raise more money, than if some other system were used. The American Medical Association underwrites all the expenses of the American Medical Education Foundation, including the costs of campaigns for funds and the educational program. The expense for such purposes in 1956 approximated \$118,000. In addition to this, the American Medical Association donated \$343,000 to the American Medical Education Foundation.

On February 11 of this year the American Medical Educational Foundation disbursed its grants to the nation's 83 medical schools. This year's total funds were \$1,072,717. Approximately \$500,000 in designated money was given to the medical schools across the nation.

At the same time that the American Medical Education Foundation distributed its grants, the National Fund for Medical Education also mailed checks to the medical schools. This year the grants included matching moneys from the Ford Foundation, which was of great help. There is probably nothing more important to practicing physicians than the financial support of our medical schools, so that they may remain free. These schools, in turn, feel deeply indebted to the physicians who have generously supported the American Medical Education Foundation and to industry and individuals who have supported the unselfish efforts of the officers and directors of the National Funds for Medical Education. Both organizations must prosper, and we are confident that both will receive your very necessary support.

PRESIDENT'S LETTER

Each state has an outstanding and respected physician who is in charge of the campaign to solicit funds. In Minnesota this post is occupied by Dr. Charles E. Rea of St. Paul. Each county or district medical society has a chairman who solicits funds in your region. It seems hardly apropos to refer to this action as "soliciting," because you as physicians should search out this man in your community and make a generous donation for the betterment of your medical school.

MINNESOTA STATE MEDICAL ASSOCIATION AMERICAN MEDICAL EDUCATION FOUNDATION

Report of 1956 Campaign Solicitation

County Society	Per Cent of goal reached	Amount Contributed	Per Cent of Members Contributing
1. McLeod	117.6	\$ 500.00	100.0
2. Steele	107.0	430.00	88.2
3. Wabasha	100.0	300.00	75.0
4. Red River Valley.....	96.3	1,200.00	77.5
5. Southwestern	95.6	1,315.00	74.5
6. Lyon-Lincoln	92.3	485.00	80.9
7. Goodhue	89.1	490.00	90.9
8. Waseca	88.8	175.00	87.5
9. Blue Earth	83.5	940.00	97.7
10. West Central	77.1	405.00	76.1
11. Blue Earth Valley.....	73.6	700.00	63.2
12. Freeborn	65.0	405.00	60.0
13. East Central	63.7	590.00	100.0
14. Mower	60.4	515.00	68.7
15. Renville-Redwood	60.0	315.00	63.0
16. Clay-Becker	51.8	285.00	40.9
17. Brown	51.7	362.00	53.3
18. Park Region	50.5	695.00	34.5
19. Scott-Carver	45.0	315.00	68.1
20. Rice	41.5	332.50	46.8
21. Ramsey	39.3	4,150.00	40.0
22. St. Louis	37.0	2,345.00	31.6
23. Upper Mississippi	31.5	560.00	25.3
24. Wright	30.9	75.00	21.4
25. Kandiyohi	29.4	375.00	37.2
26. Washington	25.5	115.00	33.3
27. Zumbro Valley.....	23.7	2,486.00	24.8
28. Winona	22.0	150.00	51.8
29. Hennepin	20.8	4,764.50	30.5
30. Camp Release.....	20.6	155.00	33.3
31. Nicollet-Le Sueur	17.0	85.00	100.0
32. Stearns-Benton	4.6	65.00	3.5

Totals

County Societies	\$26,121.00
Women's Auxiliary, MSMA.....	1,579.00
Minnesota Academy of Ophthalmology.....	120.00
GRAND TOTAL.....	\$27,820.00



President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

AFL-CIO TO FIGHT MEDICAL SOCIETY ACTIONS

A firm stand against the actions of medical societies who fail to go along with union labor medical programs has been agreed upon by the AFL-CIO committee on social security according to the *Summer Newsletter* issued by the Association of Labor Health Administrators. The ALHA is a group of medical directors, lay administrators and other representatives of union health center plans.

The publication calls for action on opposing the "attack and harassment of component medical societies against union plans, particularly in the states of Pennsylvania, Illinois and Colorado."

It states that at a meeting in Washington in May "at the merged headquarters" the AFL-CIO executive committee approved funds to encourage and promote the work of the ALHA in providing "technical aid to the trade union groups in development of better health service programs for the benefit of workers and their families." The letter also stated that the Association will "stand ready to bring experienced technical and legal counsel on request to the defense of the victims of any efforts on the part of medical power groups to destroy programs which endeavor to improve the quality and scope of prepaid health services available to working people and their families." The work will be carried out in co-operation with AFL-CIO through its department of social security.

The *Newsletter* used terms such as "medical power group", "fee-minded physicians" and "monopolistic elements of organized medicine" in referring to the recent actions taken by medical societies in Pennsylvania, Illinois and Colorado.

FIRST CHECKS FOR THE DISABLED GO TO 100,000

The new type of social security payments to totally disabled people aged fifty to sixty-four has begun. First checks are going out to about 100,000, but the number gaining benefits and the costs are expected to rise rapidly. Already pressure is building up to expand these benefits and to make more workers eligible to receive them.

The first checks, sent out in August, averaged \$75 each. By the end of the government's present fiscal year, next June 30, the total number of awards is expected to reach 275,000 with benefits running between 175 million and 200 million dollars. By the year 1980, it is expected that at least a million people will be getting disability-insurance benefits and that costs will run close to a billion dollars a year—just on the basis of present requirements.

To get these benefits now, an individual must be totally and permanently disabled. He or she must be able to provide "medical proof" that he is unable to engage in "any substantial gainful activity." The disability may prevent him from continuing in his normal occupation, but he still may not qualify if he is able to do another kind of work, even though it pays less than the old job.

The individual has to be disabled for at least six months before applying for benefits and then there must be convincing evidence that the disability is permanent—that later he will not recover enough to return to work. He must have social security credits for five years of work in the ten years before he became disabled and for one and one-half years of work in the three years immediately prior to the disability.

If he qualified then, he can start drawing benefits equal to what his old-age pension would be at age sixty-five—from a minimum of \$30 a month up to \$108.50. He cannot get benefits for his dependents until he reaches 65 and switches to his old-age pension.

Pressure to ease the rules already is building up. There is now a bill before Congress to give benefits to dependents of disabled workers on the same basis as those going to dependents of workers on old-age pensions.

Some members of Congress predict flatly that the minimum age limit of fifty for disability benefits is sure to be removed so that any disabled worker, no matter how young, can get benefits if he has enough social security credits.

Young workers who are disabled argue that a person who is thirty-five—or forty-five—and cannot work needs help as much as someone who is

fty, and maybe more than a worker who is sixty-five but is still able to continue on the job.

It is estimated that, for every sixty disabled workers in the fifty-to-sixty-four age bracket, there are forty more who are under age fifty.

Demands are also being heard for some easing of the present rigid rules on how badly you have to be disabled to get a pension. For one thing, you may be disabled a year, two years, three years and still be refused disability benefits if there is no reasonable indication that later you will recover sufficiently to do some kind of work. Any easing of this rule would undoubtedly bring benefits to many thousands of people now suffering from prolonged illnesses. Carried far enough, it could mean a form of sick pay under social security.

Actual cases where benefits have been granted show that the great majority of people who are unable to work are disabled by chronic diseases rather than by crippling injuries. Among applications for benefits approved so far, for instance, nearly one-third were from workers disabled by heart ailments and diseases of the blood vessels. About one-fourth were disabled by diseases of the nervous system and impaired sight or hearing. One-eighth were suffering from mental disorders.

Most of the people who have been turned down were suffering from similar ailments but it was decided either that they were not disabled enough to prevent them from doing some type of work or that there were indications they would recover enough to return to work later.

GROUP HEALTH FEDERATION MEETS IN TWO HARBORS

The Group Health Federation of America—which recently changed its name from “Co-operative Health Federation”—representing more than a score of prepaid group medicine plans—held its annual meeting in Two Harbors in July.

This group was organized in Two Harbors in 1946. The persons making up the organization for the most part, are members of labor and consumer co-operative groups and social liberals who believe in organizing medical plans to pay groups of doctors to care for them at so much per month. Two of these plans, each started within the past ten years, now cover more than half a million persons apiece.

One is the Health Insurance Plan of Greater New York which operates through thirty-two individual medical groups. The other is the Kaiser-

Permanente Plans on the West Coast. This latter group does not belong to the Group Health Association because it is not consumer operated.

A new plan with similarly huge potential—the Community Health Association of Detroit, Michigan—is planning to go into operation, with the support of the United Auto Workers. President Walter Reuther is in charge of the plan.

The Community Health Center at Two Harbors is a smaller but similar plan. The group's five doctors work in a new clinic dedicated recently by Governor Orville Freeman. The doctors care for 3,400 members and dependents for \$5.00 per month for individuals and \$9.75 for a family of two and \$11.75 for three or more. This covers both medical care and basic hospitalization in another new Two Harbors institution, Lake View Memorial Hospital, next to the co-operative clinic.

Group Health of St. Paul, which dedicated its \$800,000 home office and medical center at 2500 Como Avenue in March, like Two Harbors, will sign up members for combined medical-hospital benefits. Individuals will pay \$7.50 a month; couples, \$14.50; families, \$20.75. For this sum, the members are to get: (1) medical and surgical care, including periodic checkups and necessary shots; (2) \$15 a day for 180 days for a hospital room plus other hospital benefits.

Plan members in Two Harbors get home calls for an extra \$2.00. The St. Paul plan will charge an extra \$3.00 between 7 a.m. and 7 p.m. and \$5.00 after 7 p.m.

The St. Paul plan permits its members to choose either care at its medical center or a cash-benefit policy to use in going to any physician. The big new Detroit plan is expected to have the same provision.

STATISTICS REVEALED ON COST OF PRESCRIPTIONS

According to a recent annual report of the Department of Commerce, per capita expenditures for drugs was \$10.12 as compared to \$55 for alcoholic beverages, \$32 for tobacco products and \$18 for the repair, maintenance and parking of automobiles. Out of the \$10.12 drug bill, \$6.43 went for prescriptions.

The Journal of the American Medical Association says that “the price index for prescriptions in 1954 was 115.8 as compared with an index of 114.8 for all consumer goods and services.”

And drug costs were lower than the 1.25 index embracing the sub-indexes which make up the cost of all medical care.

Quoting an audit of 200,000 prescriptions filled in 200 drug stores from coast to coast, the *Journal A.M.A.* reports an average prescription price of \$2.51. Another survey, conducted by a team from the Brooklyn College of Pharmacy, placed the average cost even lower, at \$2.36 with one-half costing \$1.41 or less and only 6 per cent more than \$5.00. The Medimetric Institute, Inc., says the current average price is \$2.27.

AMA ANNOUNCES ADMINISTRATIVE CHANGES; ORGANIZATION OF NEW COMMITTEE

The AMA recently announced two important changes in its administrative setup.

The Board of Trustees has elevated Dr. George F. Lull of Chicago, who has been secretary-general manager of the Association for eleven years, to the newly created position of assistant to the president of the AMA. He will continue serving as secretary.

At the same time, the Board announced the appointment of Dr. F. J. L. Blasingame of Wharton, Texas, to the position of general manager of the AMA. He will take over his new duties on January 1, 1958.

In his new job, Dr. Lull will relieve the president of the Association of many of the burdens of the office, which have become especially heavy in the last few years.

New Committee

A new committee on industrial nursing has been established by the AMA's Council on Industrial Health. The committee was created to provide a "medical-nursing forum" for the consideration of problems of mutual concern. The group will meet this month in New York City.

NATIONAL MEDICAL LIBRARY SELECTS ARCHITECTS

The National Library of Medicine has moved a step closer to realization. The long sought goal—a new structure to house its valuable collection of medical literature—may soon become a reality.

Architects have been elected to complete plans for this project. They are R. B. O'Connor and W. H. Kilhman, Jr., of New York City.

Library officials are hopeful of getting their first construction money next year and are talking in

terms of nine million dollars. Before construction is begun, however, the Presidential ban on new construction by federal agencies will have to be lifted or modified.

CHIROPODISTS BIDDING FOR GREATER RECOGNITION

The organized profession of chiropody is currently engaged in a two-front campaign for Federal recognition. The Ohio Chiropodists Association has lodged a protest with the Public Health Service because the national health survey currently under way makes no allowance for foot services performed by holders of D.S.C. degrees. And the National Association of Chiropodists, headquartered in Washington, is attempting to gain recognition for its members in connection with legislative salary increases for professional personnel in the medical department of the Veterans Administration.

In reply to the protest by the OCA, Dr. Charles E. Greiner, the PHS is expected to explain that chiropody services will be reckoned with in *special* studies to be conducted later as part of the national health survey authorized by Congress.

FTC TO QUESTION EIGHTEEN FIRMS ON ANTIBIOTICS PROFITS

The Federal Trade Commission will direct the nation's 18 manufacturers of antibiotics to answer a lengthy questionnaire and give detailed information on sales volume, costs, classification of employers, pricing policy and profits. FTC last year distributed a questionnaire among manufacturers to gather data on patients, discount schedules and certain other business angles. The new one, however, will probe more intimately and deeply into the companies' operation.

Openly expressed suspicion by a few members of Congress that too fat profits were being made by "miracle drug" producers resulted in this FTC investigation which has been dragging on for about two years.

"SICK PAY" MAKES LOST TIME ALMOST PROFITABLE

Thanks to a combination of company sick pay policies, medical insurance and the tax laws, an industrial worker may make more money nursing a broken leg than he would on the job.

If his employer, like many today, retains him on the regular payroll despite the absence, up to

(Continued on Page 664)

Committee Action

Editor's Annual Report

MINNESOTA MEDICINE, the scientific standard bearer of the physicians of Minnesota, was printed in nearly 50,000 copies during 1956. The 152 original scientific articles were written primarily by Minnesota's medical authorities. Aiding these authors in the professional and business aspects of advancing medical knowledge is a remarkably large number of individuals who contributed many hours of work and thought to the success of our journal. Among the latter are the members of the Board of Editors. This group expended most of its efforts in the fields of procurement and editing of manuscripts. At its bimonthly meetings a free and active interchange of ideas on all aspects of medical journalism was the order of business. Of greatest interest in this area of their accomplishments was the Reader-Interest Survey conducted at the annual meeting, and the development of a new cover page for the journal.

This report will contain (1) a few statistics and comments concerning the field of procurement and editing; (2) brief references to the Reader-Interest Survey; and (3) recommendations for future changes in the journal and its management.

Procurement and Editing

Of the 1,552 printed pages in the volume of 1956, there were 935 reading pages devoted to the science and business matters of medicine, and 617 pages devoted to advertising. The reading pages have been divided according to Table I and the gross variety of scientific articles is demonstrated in Table II.

The majority of the scientific manuscripts were obtained by a selection of subjects and later manuscripts presented at the medical meetings of special medical societies in the state of Minnesota. The growing co-operation and support of our state medical journal by the various medical societies, the University Medical School, the Mayo Clinic, and the physicians throughout the state has reached a new height during the year. One county society offered an additional \$50.00 honorarium to the speakers at their meetings whose manuscripts were published in MINNESOTA MEDICINE. Another contributed the scientific articles of an entire issue. This growing spirit of enthusiasm and pride in our journal points to an ever-increasing value of MINNESOTA MEDICINE to the physicians of the state. A review of the published titles

Procurement and Editing
Reader-Interest Survey
Recommendations for the Future

TABLE I. READING PAGES

Original Articles	583	(Av. 48.5)
Editorial	65	(Av. 5.5)
History of Medicine	30	(Av. 2.5)
Medical Economics	38	(Av. 3.2)
Miscellaneous	219	(Av. 18.2)
	935	(Av. 77.9)

TABLE II. ORIGINAL SCIENTIFIC ARTICLES
152 or (12.6/issue)

Individual	90	(Av. 7.7)
Case Reports	17	(Av. 1.5)
Clinico-Pathological Conf.	4	(Av. .3)
Continuation Studies	11	(Av. .9)
Current Cardiac Concepts	10	(Av. .8)
Laboratory Aids	4	(Av. .3)
Public Health	1	(Av. 0.2)
Seminar	9	(Av. .7)
Miscellaneous (Cancer, Pulmonary, Tumor) ..	6	(Av. .5)

indicates a continued shortage in the fields of pediatrics and neuro-psychiatry.

Reader-Interest Survey

A poll was conducted by the research division of the School of Journalism of the University of Minnesota under the direction of Dr. Ralph D. Casey and Mr. Jack B. Haskins at the time of the annual meeting in Rochester. It was paid for out of the funds of the Board of Editors. The results have been published previously in our journal. The reading frequency of MINNESOTA MEDICINE was greater than that of the *Journal of the American Medical Association* in spite of the greater availability of the latter journal. No other ethical scientific publication ranked with these two in the interest of Minnesota's physicians. The most popular sections of the journal are, in order: table of contents, regular scientific articles, editorials, general interest and reports, and announcements. Of great importance to the Board of Editors was the demand for articles with immediate clinical application, as opposed to articles of a more fundamental and scientific nature. More articles of a short, succinct, review-type nature—the shorter the better were in demand. A complete review of the results and interpretations of this survey is attached to this annual report.

Recommendations for the Future

A number of defects in our journal are apparent to the Editor. It is hoped that the future

will see the section, "Current Concepts," grow in size and importance. These brief clinically applicable educational reviews are what many physicians have requested. An organized approach to the basic principles of psychology and psychiatry should be developed under the section of "Current Concepts." At present there is a shortage of editorials on subjects of political and economic policy. This may reflect the present caution evidenced by the physicians of the state in these fields. Summaries of the accomplishments of certain important committees should be available in each issue in the section. "Committee Action."

The use of an editorial comment restricted to one or two sentences, and published in italics, would not only make an attractive style when placed in the headings of our scientific manuscripts, but would draw reader interest. The almost continuous late publication of each monthly issue through the year is unnecessarily injurious to the advertisers of pharmaceuticals, and to the readers of our publication. A more legible and psychologically pleasing style of print should be used by our publisher. In spite of the fact that Volume 39 (1956) was published with a profit to the Association, a more realistic monetary value should be placed on MINNESOTA MEDICINE. The present charge of \$3.00 per year has existed since the journal was first published.* A change in the financial bookkeeping without increasing costs to the Society would increase the apparent value to its potential readers.

One recommendation concerning the Publishing and Financing Committee of MINNESOTA MEDICINE has been deleted from this report by order of the House of Delegates, upon recommendation of the Reference Committee.

A. H. WELLS, M.D., *Editor*

*The subscription rate was increased to \$5.00 for non-members, effective January 1, 1957.

RESEARCH ATTACK ON SARCOIDOSIS

The first co-operative research attack on a mysterious tuberculosis-like disease called sarcoidosis is now being conducted by the Veterans Administration.

The five VA hospitals which began a study in May, 1957, to learn the cause and nature of sarcoidosis so steps can be taken to prevent and treat it, are located at Atlanta, Georgia; Dallas, Texas; Madison, Wisconsin; New York City, and Washington, D. C.

A doctor at each of the five hospitals volunteered to study patients with sarcoidosis, not only clinically but with equal emphasis on factors such as environment, occupation, eating habits, and self-medication, which may furnish a lead to solving the cause of the disease.

Sarcoidosis is a more severe and much more widespread disease than has been believed, a preliminary study made by a four-man medical team from VA central office in Washington, D. C., shows. It occurs most frequently in

persons between twenty and forty years of age and produces symptoms often confused with tuberculosis, fungus diseases, and cancer. The growths or nodules characteristic of sarcoidosis usually occur in the lungs but can occur in any organ of the body.

The VA central office research team is made up of Dr. M. M. Cummings, director of research service; Dr. Edward Dunner, secretary of the VA-armed forces committee on chemotherapy of tuberculosis; Dr. R. H. Schmidt, Jr., tuberculosis service; and J. H. Williams of research statistics.

The four have been investigating sarcoidosis since 1954. Their study indicates sarcoidosis sometimes becomes a severe disabling disease and causes death in a larger number of patients than heretofore suspected. They find sarcoidosis occurs in a wide area, especially the New England, North Central, and Southeastern States. They suggest a possible correlation between distribution of the disease and some aspect of the United States pine forest environment.

Their study involves 1,700 cases of sarcoidosis diagnosed in VA hospitals between 1949 and 1956. The age, race, sex, occupation, place of birth, and place of initial hospitalization were recorded for each case. The highest rates of hospitalization for white veterans are among those born in Connecticut, Rhode Island, Georgia, Arkansas, North Dakota, Minnesota, Massachusetts, Alabama, Maine, and Virginia. The highest rates of hospitalization for Negro veterans are among those born in the Southeastern States. However, more Negro veterans than white were victims of the disease for the period of the survey. The Negro veteran hospitalization rate was 40.1 per 100,000, contrasted with 3.3 per 100,000 for white veterans.

The VA medical team said another finding of their study is that nearly all cases came from the non-arid sections of the country and that the prevalence of sarcoidosis is much higher in rural communities than in cities.

"SICK PAY" MAKES LOST TIME ALMOST PROFITABLE

(Continued from Page 662)

\$100 weekly of his salary becomes tax-exempt after the first week. And if medical insurance—company or personal—is sufficient to pay physician and hospital bills, he may well end up with more take-home pay than his colleagues who never miss a day's work.

Most employers don't worry about long-term illness; it is the repeated one-shot absences, a day or so each in duration, that are a bigger headache.

Despite all the advantages that can accrue to a man sick in bed, however, many companies actually believe man-hour losses from illnesses are dropping. They give the credit for this fact to new and relatively firm policies of policing absences.

Meetings and Announcements

STATE

MINNESOTA STATE MEDICAL ASSOCIATION, 105th annual meeting, Minneapolis, May 22, 23 and 24, 1958. Business sessions and exhibits, Minneapolis Auditorium. Headquarters, Leamington Hotel.

NATIONAL

American College of Chest Physicians, Postgraduate Courses on Diseases of the Chest, Knickerbocker Hotel, Chicago, Illinois, October 21-25, 1957; Park-Sheraton Hotel, New York, New York, November 11-15, 1957; and Ambassador Hotel, Los Angeles, California, December 9-13, 1957. Tuition \$75. Executive Director, American College of Chest Physicians, 112 East Chestnut Street, Chicago 11, Illinois.

American College of Gastroenterology, 22nd annual convention, The Somerset, Boston, Massachusetts, October 21, 22, 23, 1957.

American College of Physicians, Midwest regional meeting, Urbana, Illinois, October 12, 1957.

American College of Surgeons, Forty-third Annual Clinical Congress, Atlantic City, New Jersey, October 14-18, 1957. American College of Surgeons, 40 East Erie Street, Chicago 11, Illinois.

American Gastroenterological Association, 59th annual meeting, Washington, D. C., May 30-31, 1958. H. M. Pollard, M.D., Secretary-General, University Hospital, Ann Arbor, Michigan.

Ninth Postgraduate Assembly in Endocrinology and Metabolism, Medical College of Georgia, October 21-25, 1957.

Symposium on Fluorides, Institute of Industrial Health, College of Medicine, University of Cincinnati, Cincinnati, Ohio, December 9-11, 1957. Secretary, Institute of Industrial Health, Kettering Laboratory, Eden and Bethesda Avenues, Cincinnati 19, Ohio.

INTERNATIONAL

Congress of International Society of Surgery, Mexico City, Mexico, October 27-November 2. Dr. L. Dejardin, 141 rue Belliard, Brussels, Belgium.

Fifth International Congress of Internal Medicine, Philadelphia, Pennsylvania, April 24-26, 1958. Edward R. Loveland, Secretary-General, 4200 Pine Street, Philadelphia 4, Pennsylvania.

Inter-American Congress of Pan American Medical Association, Mexico City, Mexico, November 18-22, 1957. Executive Director, Dr. Joseph J. Eller, 745 Fifth Avenue, New York 22, New York.

Pan American Congress of Endocrinology, Buenos Aires, Argentina, November 3-9, 1957. Secretaria-General, Sociedad Argentina de Endocrinología y Metabolismos, Sante Fe 1171, Buenos Aires, Argentina.

Pan-Pacific Surgical Association, Seventh Congress, Honolulu, Hawaii, November 14-22, 1957. Dr. F. J. Pinkerton, Director General, Pan-Pacific Surgical Association, Room 230, Young Building, Honolulu, T. H.

World Congress of Gastroenterology, Washington, D. C., May 25-31, 1958. H. M. Pollard, M.D., Secretary-General, University Hospital, Ann Arbor, Michigan.

ACADEMY OF PSYCHOSOMATIC MEDICINE

The fourth annual meeting of The Academy of Psychosomatic Medicine will be held October 17-19, 1957, at the Morrison Hotel in Chicago. The program will be devoted to "Psychosomatic Aspects of Obstetrics, Gynecology, Endocrinology and Diseases of Metabolism." Sessions will be open to all scientific disciplines, as well as psychologists, social workers and nurses. Information may be obtained from Dr. William S. Kroger, secretary, 104 South Michigan Avenue, Chicago 3, Ill.

AMERICAN MEDICAL ASSOCIATION

The American Medical Association has announced two important changes in its administrative setup.

The Board of Trustees has elevated Dr. George F. Lull, who has been secretary-general manager of the Association for eleven years, to the newly-created position of assistant to the president of the AMA. He will continue serving as secretary, which is an elective office.

At the same time, the Board announced the appointment of Dr. F. J. L. Blasingame of Wharton, Texas, to the position of general manager of the AMA. He will take over his new duties January 1, 1958.

Dr. Blasingame has been active in medical affairs, both at the state and national level for many years. He has been a member of the Board of Trustees since 1949 and has served as president of the Texas State Medical Association.

SYMPOSIUM ON RADIOISOTOPES

The Milwaukee Academy of Medicine will present a symposium on radioisotopes at Marquette University, Brooks Memorial Union, Saturday, December 7, 1957, from 9:00 a.m. to 4:00 p.m. Fundamental information with medical orientation will be presented, and all physicians are invited to attend. The program includes: "Basic Cellular and Histologic Changes Produced by Radiation Energy" by Dr. William Bloom, professor of anatomy, University of Chicago; "Radioisotope Chemistry" by Dr. Edward A. Doisy, Jr., associate professor of internal medicine, St. Louis University School of Medicine; "Basic Nuclear Physics and Instruments" by Titus C. Evans, Ph. D., professor of radiation research,

MEETINGS AND ANNOUNCEMENTS

State University of Iowa College of Medicine; "Radioisotope Pharmacology" by Dr. E. M. K. Geiling, professor of pharmacology, University of Chicago; "Basic Radiation Biology" by Harvey M. Patt, Ph. D., senior physiologist, Argonne National Laboratory; and "Radioisotope Physiology" by Dr. Joseph F. Ross, professor of medicine and associate dean, University of California School of Medicine. Dr. Austin M. Brues, director, biology division, Argonne National Laboratory, will serve as moderator.

Reservations may be made by writing the Milwaukee Academy of Medicine 561 N. 15th Street, Milwaukee 3, Wisconsin.

CONTINUATION COURSES

Medical continuation courses to be presented at the Center for Continuation Study, University of Minnesota, include the following:

October	7- 9	Obstetrics for General Physicians
October	24-26	Symposium on Skin Cancer for Specialists
November	4- 9	Cardiovascular Radiology for Specialists
November	18-20	Physical Medicine for Specialists

For further information concerning the above courses, write to the Director, Department of Continuation Medical Education, 1342 Mayo Memorial, University of Minnesota, Minneapolis 14.

MINNESOTA MEDICAL FOUNDATION DAY

Minnesota Medical Foundation Day will be Monday, September 30. Guest speaker will be Dr. Dana W. Atchley, Professor of Clinical Medicine, Columbia University College of Physicians and Surgeons and Visiting Physician, Presbyterian Hospital, New York City, who for many years has combined a very active private practice with a career as a teacher and investigator. Dr. Atchley will speak at 11:00 a.m. in the Mayo Memorial Auditorium on the University of Minnesota Campus. All physicians are cordially invited to attend.

SYMPOSIUM ON RECENT DEVELOPMENT IN DIABETES MELLITUS

An all-day symposium on "Recent Developments in Diabetes Mellitus" (pathology diagnosis and therapy) will be sponsored by the Chicago Diabetes Association, November 20, 1957, at the Drake Hotel, Chicago. Registration is scheduled for 8:45 a.m. and lectures will begin at 9. An enrollment fee of \$25.00 will be charged.

Members of the Academy of General Practice who attend the conference may claim hour-for-hour Category II credit.

Henry T. Ricketts, M.D., Professor of Medicine, University of Chicago Clinics, will be Moderator, and the following program will be presented:

Pathology of Diabetes Mellitus in Man—Aaron Arkin, M.D., Chief of Medicine, Louis A. Weiss Memorial Hospital; Professor of Medicine, University of Illinois College of Medicine and Cook County Hospital Graduate School of Medicine, Chicago.

Metabolic Derangements in Diabetes Mellitus—Rach-

miel Levine, M.D., Chairman, Department of Medicine, Michael Reese Hospital, Chicago.

The Metabolism of I¹³¹ Labeled Insulin—Solomon A. Berson, M.D., and Rosalyn S. Yalow, M.D., Chief and Assistant Chief, Radioisotope Service, Veterans Administration Hospital, New York.

Insulin Resistance—Arthur R. Colwell, M.D., Professor of Medicine and Chairman, Department of Medicine, Northwestern University Medical School, Chicago.

Oral Hypoglycemic Agents in the Treatment of Diabetes—Alexander Marble, M.D., Joslin Clinic, Professor of Medicine, Harvard Medical School, Boston.

Current Concepts of the Pathogenesis of Diabetic Retinopathy—David A. Rosen, M.D., Department of Ophthalmology, Kingston General Hospital, Kingston, Ontario.

Diabetic Nephropathy—Robert M. Kark, M.D., Professor of Medicine, University of Illinois College of Medicine, Chicago.

Juvenile Diabetes—Howard S. Traisman, M.D., Children's Memorial Hospital; Associate in Pediatrics, Northwestern University Medical School.

MINNESOTA HEART ASSOCIATION

Dr. Milton M. Hurwitz, St. Paul cardiologist, was elected president of the Minnesota Heart Association, at the annual meeting in St. Paul in July. Dr. Karl W. Anderson, Minneapolis, was named first vice president, and Dr. Robert A. Good, University of Minnesota, was elected secretary.

The Association approved \$201,000 in local research awards for 1957-58. Grants from the American Heart Association to Minnesota scientists will bring total Heart Fund research spending in Minnesota to \$317,732 during the next twelve months. Sixty-three men will share the awards.

The Minnesota Heart Association this year noted its tenth Anniversary. Since 1947, it has distributed over \$1.1 million in research awards, allocated from Heart Fund contributions of \$2.2 million.

TWO FELLOWSHIPS TO RECRUIT WORKERS IN AUDIOLOGY AND SPEECH

Establishment of two fellowships in Audiology and Speech at Northwestern University is announced by the American Hearing Society, its member agency, the St. Paul Hearing Society, and the university. The new training program will be geared to preparing qualified persons for work in local hearing societies.

The fellowships, made possible by a bequest from the Myers Foundation of Saint Paul, Minnesota, are to be known as The Reine Humbird Myers Fellowships. Each fellowship will pay \$3,000 a year for two years.

Applicants may write to Crayton Walker, executive director, American Hearing Society, 1800 H St., N.W., Washington 6, D. C., or to Dr. Raymond Carhart, School of Speech, Northwestern University, Evanston, Illinois.

Woman's Auxiliary

AMA AUXILIARY PRESIDENT, AND DOCTOR ALVAREZ TO ADDRESS SCHOOL OF INSTRUCTION

The annual School of Instruction for all state and county officers of the Woman's Auxiliary to the Minnesota State Medical Association will be held at the Hotel Leamington in Minneapolis, Tuesday, October 8.

Following the program will be Mrs. Paul C. Craig of Wyomissing, Pennsylvania, president of the Woman's Auxiliary to the American Medical Association, and Dr. Walter Alvarez, nationally-known newspaper columnist and editor-in-chief of *Modern Medicine*.

An attendance of approximately 100 is expected at the day-long session and luncheon. Reservation blanks will be sent to all state officers, state committee chairmen and county presidents, but any Auxiliary member is cordially invited to attend. Reservations for the luncheon may be obtained by contacting Mrs. Edward T. Evans, 5308 Blake Road, Minneapolis, 24, Minnesota.

An outstanding program of instruction has been planned, with the county officer particularly in mind. Mrs. Craig will be in attendance at the sessions in addition to speaking before the group.

Mrs. Craig is a graduate of West Virginia University, took post-graduate work at Columbia University, and had a dietetic internship at Presbyterian Hospital in New York before her marriage to a Reading, Pennsylvania, ophthalmologist. In addition to her medical auxiliary work, she has served on the boards of the YWCA, the PTA, the Historical Society of Berks County, the Council of Social Agencies and has been president of the Reading Branch of the American Association of

INTRODUCING THE NEW STATE PRESIDENT-ELECT

Mrs. Reuben Erickson, president-elect of the Woman's Auxiliary to the Minnesota State Medical Association, comes into her work in the medical field naturally because of the zest of her husband, whose record of public leadership has been well shown in the many offices he has held, both medically and politically.

Better known as "Hazel" Erickson, the new president-elect, is a native of Minneapolis. She graduated from the University of Minnesota and taught at Roosevelt High School in Minneapolis both before and after her marriage, while her husband finished his medical education and set up his practice.

Hazel has held just about every office in the Hennepin County Medical Auxiliary, covering a period of about twenty-eight years. She has been on the state board, on and off, for the last sixteen years.

Both of her children are following the line of medicine; her daughter, Patty, is in her senior year at the University of Minnesota in occupational therapy and her son, Hartley, is in his third year of premedicine at the University.

Mrs. Erickson's special interests and activities center around Mount Olivet Lutheran Church in Minneapolis and the Minneapolis Church Council. This past summer, she has been busy helping to entertain the overseas guests attending the Lutheran World Federation which met in Minneapolis.

Another pet project has been her work with senior citizens. She helped to organize the first hobby show for senior citizens in Minneapolis and later became chairman of the show. She is now a member of the board of the Council House for Senior Citizens. Last year, this energetic worker suggested that the Hennepin County Medical Auxiliary help the Council House by sponsoring a sale of articles made through the handicraft of senior citizens. Under her direction, the sale was held at Donaldson's in Minneapolis and was very successful. The Hennepin Auxiliary will sponsor a similar sale this coming year.

Hazel Erickson's love of people and her desire to promote good feeling among people will be a sure asset towards a very fine public relationship between the physicians and lay groups—the aim of every auxiliary unit in Minnesota.

MEMORIAL SERVICES CONDUCTED FOR DECEASED MEMBERS

A portion of both the state auxiliary meeting in St. Paul in May and the national auxiliary meeting in New York in June was devoted to memorial services for Auxiliary members who have died during the past year. A particularly lovely service was given by Mrs. Charles Waas, In Memoriam chairman, at the state meeting in St. Paul. The following Minnesota members were honored at both services.

Mrs. E. J. Wohlrabe, Springfield
Mrs. Magnus Westby, Madison
Mrs. John R. Peterson, Minneapolis
Mrs. Edwin N. Nelson, Minneapolis
Mrs. Nathan K. Jensen, Minneapolis
Mrs. George Eitel, Minneapolis
Mrs. A. Carlyle Tingdale, Hibbing
Mrs. Alvin Westerman, Montgomery
Mrs. Ludwig L. Sogge, Windom
Mrs. George Badeaux, Brainerd
Mrs. Haddow M. Keith, Rochester

SPORTS DURING PREGNANCY

Women during uncomplicated pregnancy may participate safely in any common sports in which they are proficient. An experienced swimmer may safely swim while pregnant, an expert horsewoman may ride (but not jump), a good skater may skate. If a woman plays tennis, she should play doubles, and if she bowls, she should play only a few games at a time. Practically all women may dance but "preferably not the dances which demand frequent sudden gyrations."—Queries and Minor Notes, *J.A.M.A.*, July 13, 1957.

In Memoriam

PAUL E. BARRINGER

Dr. Paul E. Barringer, practicing physician in St. Cloud, Madison Lake, and St. Paul for many years, died June 30, 1957, in Brooklyn, New York. He was seventy-one years old.

A graduate of the Minneapolis College of Physicians and Surgeons, Dr. Barringer took postgraduate work in Europe and practiced in St. Paul from 1908 to 1926. He moved to Madison Lake in 1926 and stayed there until he settled in St. Cloud in 1936. He had lived in Long Island, New York, until his retirement in 1949. He served in the merchant marine during World War II.

Dr. Barringer had belonged to the Ramsey County Medical Society, the Stearns-Benton County Medical Society, the Minnesota State Medical Association and the American Medical Association.

He is survived by a son, Paul, Minneapolis; a daughter, Mrs. Shirley Hamburg, Long Island, and five grandchildren.

MANDRED W. COMFORT

Dr. M. W. Comfort, a member of the Mayo Clinic staff since 1928, died August 7, 1957. He was sixty-two years old.

Dr. Comfort was born in Hillsboro, Texas, attended Austin College, Sherman, Texas, and received his medical education at the University of Texas in Galveston. He was adjunct professor of anatomy at the University of Texas and later took postgraduate work in neurology at the Mayo Foundation in Rochester.

Dr. Comfort specialized in diseases of the stomach and intestines.

He was a member of the Zumbro Valley Medical Society, the Minnesota State Medical Association, the American Medical Association, the American College of Physicians, the Southern Minnesota Medical Association, the Central Society for Clinical Research, the American Gastro-enterological Association, the Alumni Association of the Mayo Foundation, and an honorary member of the Hill County (Texas) Medical Society. He also held membership in Alpha Kappa Kappa, Alpha Omega Alpha and Sigma Xi fraternities.

JOHN M. CULLIGAN

Dr. John M. Culligan, St. Paul surgeon for thirty-two years, died August 7, 1957. He was sixty-two years old.

At the time of his death, he was chief of the surgical staff at Ancker Hospital, St. Paul, and consulting physician for the Little Sisters of the Poor.

Dr. Culligan was born in Yankton, South Dakota, attended St. Thomas Academy and College, St. Paul, Notre Dame University and the University of Minnesota Medical School, from which he graduated in 1920. After winning a fellowship from the Mayo Foundation to complete his Master of Science work, he entered private practice in St. Paul in 1925.

He was a member of the American College of Sur-

geons, the Minnesota State Medical Association, the American Medical Association, the American Urological Association and the Minnesota Academy of Medicine. Dr. Culligan was also a past president of the Ramsey County Medical Society and the St. Paul Surgical Society.

Other memberships included the Advisory Board of the Association of Residents and Ex-Residents of the Mayo Clinic and the Board of Athletics at Notre Dame University. He was also a former chief of staff at St. Joseph's Hospital, St. Paul.

Surviving are his wife, Margaret; four sons, Dr. John A., Robert E., David E., and F. Joseph Culligan, all of St. Paul; two daughters, Mrs. Molly Olin, Minneapolis, and Margaret Culligan, St. Paul; five grandchildren; two brothers, Emmett J. Culligan, San Bernardino, California, and Dr. Leo C. Culligan, Minneapolis, and a sister, Anne V. Culligan, Minneapolis.

HOWARD L. EDER

Dr. Howard L. Eder, a former Minneapolis physician, died in July, 1957, in Santa Barbara, California. He was sixty years old.

Dr. Eder was born in Blue Earth, Minnesota and graduated from the University of Minnesota Medical School in 1922. After completing his internship, he studied pediatrics in Berlin and Vienna. He practiced medicine in Minneapolis until 1929 when he moved to Santa Barbara.

He was a member of the Minneapolis Athletic Club and the Gyro Club of Minneapolis. He also was a charter member of both the American Academy of Pediatrics and the American Board of Pediatrics.

Survivors include his wife, Margaret; two daughters: Patricia, Santa Barbara, and Mrs. Wynne C. Smallwood, Berkeley, California; three brothers: Walter, Blue Earth; Edward, Excelsior, Minn., and William, North Branch, Minn.; two sisters: Mrs. Arlo Sillman, Everett, Washington, and Mrs. John Rogers, Minneapolis; his step-mother, Mrs. August Eder, Santa Barbara, and a step-sister, Mrs. Robert Path, Santa Barbara.

OLE J. GRUNDSET

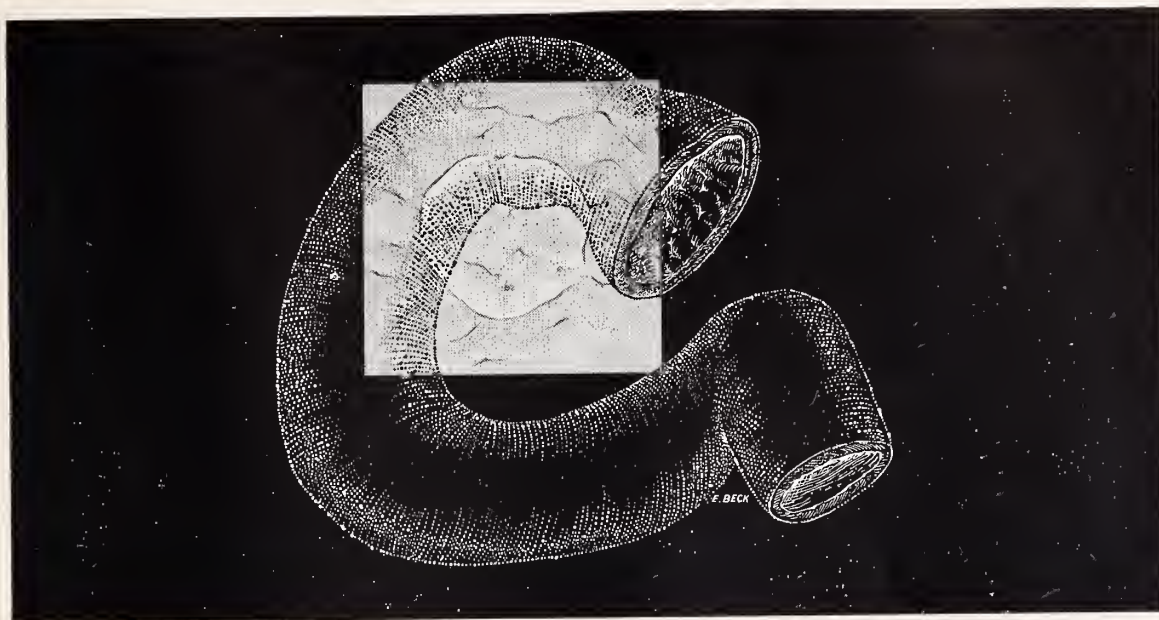
Dr. Ole J. Grundset died June 30, 1957. He had been located in Montrose, Minnesota, since 1932. He was seventy years old.

Dr. Grundset was born near Barnesville, Minnesota, and attended Maplewood Academy at Hutchinson, Minnesota, Union College, Lincoln, Nebraska, and received his medical education at the College of Medical Evangelists, Los Angeles, California.

After his internship at White Memorial Hospital in Los Angeles, he practiced in Imperial County, California, and in Excelsior, Minnesota, before moving to Montrose. He and his wife also spent eight years in

(Continued on Page A-46)

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1. Lichstein, J.; Morehouse, M. G., and Osmon, K. L.: *Am. J. M. Sc.* 232:156 (Aug.) 1956.

2. Sun, D. C. H., and Shay, H.: *Arch. Int. Med.* 97:442 (April) 1956.

3. Rafsky, H. A.; Fein, H. D.; Breslaw, L., and Rafsky, J. C.: *Gastroenterology* 27:21 (July) 1954.

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5. Silver, H. M.; Pucci, H., and Almy, T. P.: *New England J. Med.* 252:520 (March 31) 1955.

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*A complete report on these animal feeding studies is available on request. Address WISCONSIN ALUMNI RESEARCH FOUNDATION, P. O. Box 2217, Madison 1, Wis.

OLE J. GRUNDSET

(Continued from Page 668)

Manchuria in mission service. Mrs. Grundset preceded the doctor in death in 1950.

A member of the Wright County Medical Society, Dr. Grundset also belonged to the Minnesota State Medical Association.

He is survived by two daughters: Ruby Grundset Drahosh, Pine City, and Pearl, Montrose; three sisters: Mrs. Ina Hendrickson, Estacada, Oregon; Mrs. Oscar Shulstad, Barnesville, Minnesota, and Mrs. Oscar Vixie, Milton-Freewater, Oregon; two brothers: Anol, Loma Linda, California, and Henry. Arpin, Wisconsin, and several nieces and nephews.

OSCAR C. HEYERDALE

Dr. Oscar C. Heyerdale, retired assistant superintendent of the Rochester State Hospital, died July 20, 1957. He was eighty-four years old.

Dr. Heyerdale was born in La Crosse, Wisconsin, and received his medical education at Northwestern University. He was assistant physician at the Rochester State Hospital from 1899 to 1912, when he became assistant medical superintendent, a position he held for thirty-eight years until his retirement in 1937.

The oldest past master of the Rochester Masonic Lodge, he was also a member of the Zumbro Valley Medical Society, the Minnesota State Medical Association and the American Medical Association.

He is survived by six grandchildren. His wife, a son and a daughter all preceded him in death.

HOBART C. JOHNSON

Dr. Hobart C. Johnson, nationally-known Mankato eye specialist, died July 23, 1957, in Duluth, Minnesota. He was sixty years old.

Dr. Johnson, who had practiced in North Mankato for twenty years, was known throughout the United States for his work in the treatment of diseases of the eye and eye surgery.

A native of Olfburg, Kansas, he graduated from Gustavus Adolphus College, St. Peter, Minnesota, and received his medical education at the University of Minnesota. He later served on the board of trustees at Gustavus and was honored at the graduation exercises of the college last year with the "Greater Gustavus" award, which is given annually to an individual who has done outstanding work for the college.

He took postgraduate work at the New York Postgraduate Hospital and School in New York City. Before moving to Mankato, he served as a medical missionary in Africa from 1928 to 1938. In preparation for this assignment, he took work in tropical medicine in England and became a member of the Royal Society of Tropical Medicine.

Dr. Johnson was a staff member of both Immanuel and St. Joseph's Hospitals in Mankato, a deacon of the Grace Lutheran church, and a member of the Nicollet-Le Sueur Medical Society, the Minnesota State Medical

(Continued on Page A-48)

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HOBART C. JOHNSON*(Continued from Page A-46)*

Association and the American Medical Association. He served as secretary-treasurer of the county society for three years. He was also a member of the Minnesota Academy of Ophthalmology.

He is survived by his wife, Ruth; two daughters, Mrs. Russell Knutson, Fort Smith, Arkansas, and Dorothy, Mankato; one son, Wendell, Duluth; his mother, Mrs. A. G. Johnson, Mankato, and two grandchildren.

JOHN E. OSBORN

Dr. John E. Osborn, Rochester, Mayo Clinic staff member, died July 30, 1957. He was thirty-eight years old.

Dr. Osborn was born in Wolcott, New York, attended the University of Notre Dame and Syracuse University and received his medical education at the University of Buffalo. He interned at Rochester General Hospital, Rochester, New York, and moved to Rochester in 1944 as a fellow in anesthesiology. He served with the Army Medical Corps from 1946 to 1948 and on January 1, 1949, was appointed to the staff of the Mayo Clinic. The same year he was certified as a specialist in anesthesiology by the American Board of Anesthesiology, Inc. In 1956, he was appointed an instructor in anesthesiology in the Mayo Foundation.

A member of the Zumbro Valley Medical Society, Dr.

Osborn also belonged to the Minnesota State Medical Association and the American Medical Association. His other memberships included the American Society of Anesthesiologists, the International Anesthesia Research Society, the Alumni Association of the Mayo Foundation, the American College of Anesthesiologists and the International College of Anesthetists. He also belonged to the Minnesota Society of Anesthesiologists, Alpha Chi Sigma, professional chemical fraternity, and Nu Sigma Nu, professional medical fraternity. He was an honorary member of the Cuban Society of Anesthesiologists.

Survivors include his wife, Agnes; four children, Michael, twelve; Stephen, nine; Mary, six and Julianne, five weeks; his parents, Mr. and Mrs. Homer S. Osborn, Wolcott, New York, and a brother, Stewart, Shreveport, Louisiana.

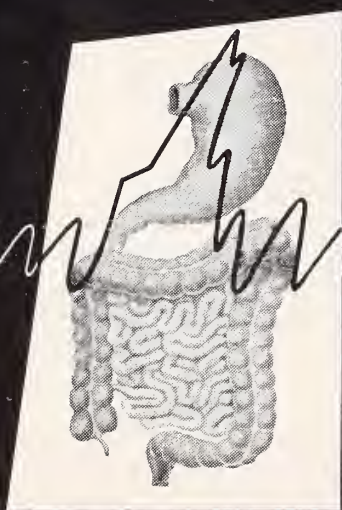
GEORGE E. SHERWOOD

Dr. George E. Sherwood, who practiced medicine in Kimball, Minnesota, for nearly sixty years, died in St. Cloud, July 5, 1957. He was eighty-five years of age and was known as "Minnesota's oldest practicing physician."

A graduate of the University of Minnesota Medical School, Dr. Sherwood was recently honored by St. Joseph's Hospital in St. Paul as the only physician of that institution's first intern class. He was there from 1893 to 1894 and in October, 1894, opened an office at

(Continued on Page A-50)

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GEORGE E. SHERWOOD

(Continued from Page A-48)

Dassel where he practiced until 1900 when he moved to Kimball.

Dr. Sherwood established the first hospital in Meeker County, served as president of the village council of Kimball at one time and was an active Guernsey cattle enthusiast. In 1928 he attended the International Dairy Congress in London on an appointment by President Coolidge. He traveled to Vienna in 1930 for post-graduate work, in 1949 toured South America and in 1955 spent the summer in Europe.

A member of the Minnesota State Medical Association, which honored him for fifty years of practice in 1944, Dr. Sherwood also belonged to the American Medical Association, the American Academy of General Practice, the Northern Minnesota Medical Association, which he served as president, the Stearns-Benton County Medical Society, which he also served as president, the Crow River Medical Society, of which he was a charter member, and the American Medical Association of Vienna. He was an active member of the medical staffs of the St. Cloud and Litchfield Hospitals and a member of the Minnesota Historical Society.

His other memberships included the Church of Christ in Kimball, the Masonic Lodge, the St. Cloud Kiwanis Club, and the State Bank of Kimball which he helped organize in 1901 and which he served as vice president and director.

Dr. Sherwood's wife, Mary, preceded him in death in 1955. He is survived by three daughters: Mrs. Edward Lax, Spokane, Washington; Mrs. Kenneth Lewis, Detroit, Michigan, and Mrs. Orville Nelson, St. Petersburg, Florida, and four grandchildren.

HOMER R. SMITH

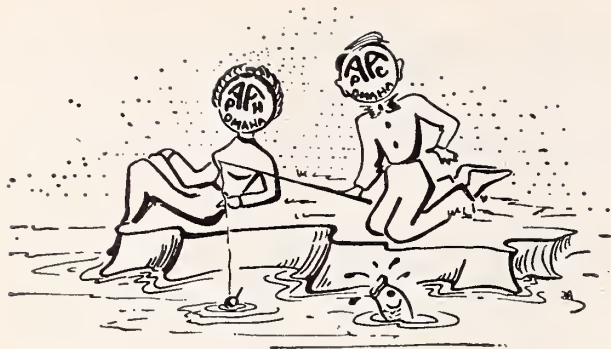
Dr. Homer R. Smith, Minneapolis resident for over sixty-three years, died August 11, 1957. He was seventy-four years old.

Dr. Smith was born in Littleton, New Hampshire, and received his medical education at the University of Minnesota. He interned at Ancker Hospital, St. Paul, and later had his office in the Medical Arts Building in Minneapolis.

A member of the Hennepin County Medical Society, Dr. Smith was also a member of the '50 Club' of the Minnesota State Medical Association. His other memberships included the American Medical Association, Ark Lodge 176 of the Masons, the Scottish Rite Temple and the Optimist Club. He belonged to Grace Presbyterian Church, Minneapolis.

Survivors include his wife, Marian Latta; a daughter, Mrs. Fred C. Jones, South St. Paul, and a brother, Harlan, Minneapolis.

True progress in law, in medicine—in almost any area of vital human concern—will come from the discovery and cultivation of common interests by people who share a common purpose, unadulterated by special political objectives or ideological differences.—Editorial, *World Medical Journal*, May, 1956.



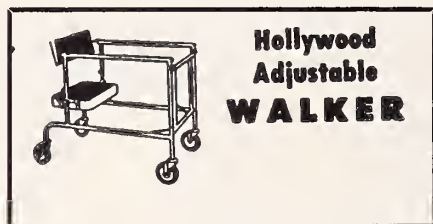
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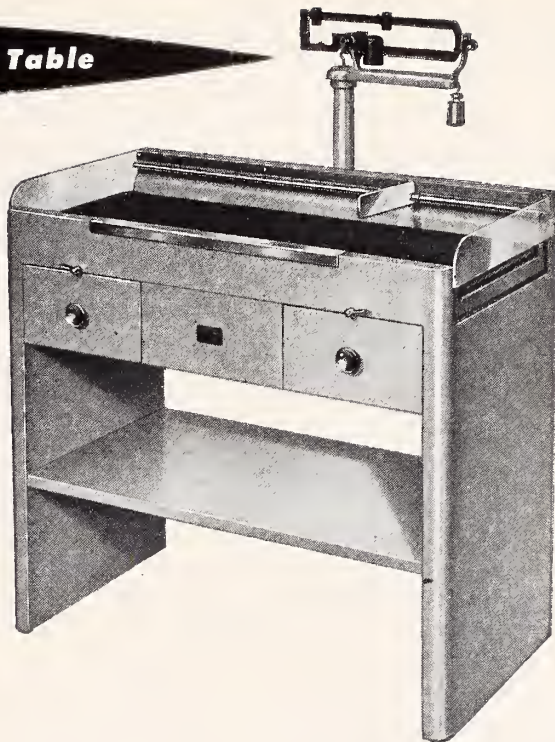
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General Interest

Guest speaker at the July 14 dinner and rededication ceremonies of the expanded Iron Range Rehabilitation Center at Virginia, Minnesota, was **Dr. Frank H. Krusen**, head of the section on physical medicine at the Mayo Clinic and Mayo Foundation. Dr. Krusen is especially interested in community work in rehabilitation of the handicapped, and works with a number of groups throughout the state.

* * *

Dr. B. J. Cronwell, Austin, was recently elected to the board of directors of the Minnesota Heart Association.

* * *

The Group Health Federation of America at its annual meeting in July elected **Dr. William Kosiak**, medical director of the Community Health Center at Two Harbors, as secretary-treasurer of the federation.

* * *

The Minnesota State Board of Health has announced that **Dr. Sidney Finkelstein** will succeed **Dr. Mary C. Ghostley** as director of Health District 1 at Bemidji. Dr. Finkelstein, who has been serving as a sub-area director in the division of Indian Health of the U.S. Public Health Service at Bemidji, received his medical education at the Royal College of Surgeons, Edinburgh, Scotland, and has been taking advanced work in public health at the University of Minnesota.



"WHERE'S MINE? I'D LIKE TO DEFEND MYSELF."

Four Minnesota doctors included an African safari as part of their vacation schedule. **Dr. P. W. Harrison**, Worthington, and **Drs. Joseph Friberg**, Conrad Karleen, and **Joseph Resch**, Minneapolis, left in mid-July for a five-week trip to Nairobi, Kenya, British East Africa, for a combined hunting expedition and visit to medical missions in Africa. Dr. Friberg is a former medical missionary in Africa.

* * *

Dr. R. A. Belcher, specialist in internal medicine, commenced medical practice at the Little Falls Clinic in July. He was formerly associated with the clinic at Graceville, Minnesota.

* * *

At the annual meeting of the medical staff of the Pine County Memorial Hospital at Sandstone, July 16, the following officers were elected for the coming year: **Dr. H. W. Henry**, Hinckley, president; **Dr. E. G. Hubin**, Sandstone, vice president; **Dr. M. S. Munson**, Barnum and Willow River, secretary-treasurer. **Dr. G. Albin Mattson**, executive secretary of the Minneapolis War Memorial Blood Bank, was guest speaker at this meeting.

* * *

Construction of a modern medical center at Chaska, Minnesota, was begun in mid-July, according to **Dr. G. T. Schimelpfenig**, who has practiced in that community for the past twenty-five years.

* * *

Dr. Robert N. Barr, secretary and executive officer of the Minnesota State Board of Health, has been reappointed to a four-year term on the United States surgeon-general's advisory committee on Indian health.

* * *

St. Joseph, Minnesota, is the new location of **Dr. William Davidson**, a graduate of Duke University. In addition to medical practice in St. Joseph, Dr. Davidson will teach psychology at St. John's university and care for patients at the infirmaries at St. John's and the College of St. Benedict, located at St. Joseph.

* * *

Dr. George C. Kimmell has left his medical practice with the Interstate Clinic at Red Wing to become associated with **Dr. Henry P. Staub**, Minneapolis, in a pediatric practice.

* * *

Dr. Stanley B. Lindley, former superintendent of the Willmar State Hospital and presently director of professional services at the Veterans Administration Hospital at Knoxville, Iowa, has recently been appointed as manager of the Veterans Hospital at St. Cloud.

* * *

Dr. John A. Seaberg, manager of the Veterans Hospital, Minneapolis, since 1950, retired August 31. He has

(Continued on Page A-54)

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(Continued from Page A-52)

been associated with the hospital for the past twenty-five years and has served throughout his entire career in the U. S. Public Health Service and the Veterans Administration.

* * *

Dr. Julius H. Singbeil, a graduate of the University of Manitoba, who formerly practiced at Rutland, North Dakota, has become associated with the clinic at Breckenridge, Minnesota.

* * *

Dr. John B. Sanford, who recently completed a four-year residency at the Illinois Research and Educational Hospital in Chicago, has returned to the Duluth Clinic where he is a member of the surgical department.

* * *

Dr. Robert Olson, a 1956 graduate of the University of Minnesota Medical School, who has recently completed his internship at Miller Hospital, St. Paul, has joined the staff of the Monson Clinic at Canby.

At the recent annual meeting of the Minnesota Academy of Occupational Medicine and Surgery, the following officers were elected: **Dr. O. W. Foster**, Minneapolis, president; **Dr. T. E. Barber**, Austin, vice president; **Dr. J. A. Williams**, St. Paul, secretary; **Dr. R. W. Goltz**, Minneapolis, treasurer; **Dr. B. I. Derauf**, Saint Paul, recorder; and **Dr. John Barker**, Duluth, member of executive committee.

* * *

Drs. Harold W. Hermann and **Dean J. Hempel**, Minneapolis, announce the association of **Dr. A. Cornell Erlanson** with them in the practice of pediatrics.

* * *

Dr. Erling Nord and **Dr. Philip Parker** of Hallock, have opened a new medical clinic at Staples, Minnesota.

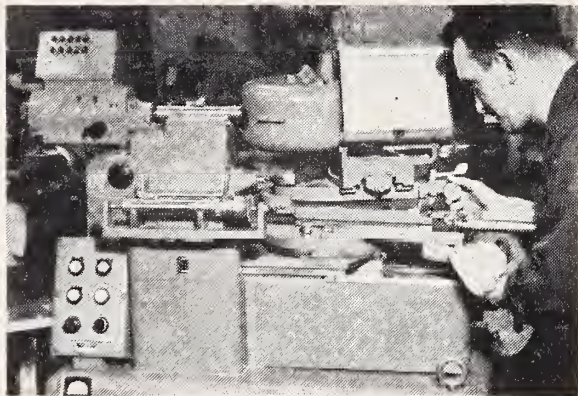
* * *

Dr. Charles W. Mayo was the speaker on August 13 in St. Paul at the International Association of Laryngectomees, an organization of persons who have had cancer surgery resulting in loss of the vocal cords.

(Continued on Page A-56)

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(Continued from Page A-54)

An addition to the Oxboro Clinic, Minneapolis, will be ready for occupancy about December 1, according to Dr. Lester E. Gallett. Dr. Jack Kirkham, former manager of the Hudson, Wisconsin, clinic, became business manager of the Oxboro Clinic on September 1. When the addition is completed, two more physicians will be added to the staff.

* * *

At the annual meeting of the Minnesota Heart Association held in St. Paul, July 9, Drs. Paul F. Dwan, L. F. Richdorst, and W. C. Preus, all of Minneapolis, founding officers of the organization, were honored.

* * *

Dr. W. R. Koons, who has practiced medicine in Lidgerwood, North Dakota, for the past five years, has moved to Mahanomen, Minnesota. A graduate of Northwestern University School of Medicine, Dr. Koons has taught at the University of North Dakota School of Medicine in Grand Forks.

* * *

Dr. A. C. Hilding, Duluth, received the degree of doctor of science, *honoris causa*, at commencement exercises of Gustavus Adolphus College at St. Peter, Minnesota, on June 2, 1957.

* * *

Dr. J. K. Butler, Cloquet, attended the Ninth International Congress on Arthritis at Toronto, June 23-28, 1957.

* * *

A certificate of achievement has been awarded by the medical department of the U. S. Army to Dr. Richard C. Lillehei, medical fellow in the University of Minnesota department of surgery, in recognition of his contribution, while on active duty from 1954 to 1956, to the advancement of the service's research and development program with his work on hemorrhagic shock.

* * *

Two new physicians have joined the staff of the East Range Clinic in Virginia. Dr. M. Thomas Summar, a graduate of Tulane University School of Medicine, is an ear, nose and throat specialist. Dr. George B. Ewens, son of the late Dr. Harry B. Ewens, one of the founders of the East Range Clinic, has completed a three-year residency in dermatology and joined the clinic staff August 1. There are now nineteen doctors on the staff of the East Range Clinic, twelve of them in Virginia.

* * *

Dr. F. T. Sorum, staff member of the Willmar State Hospital since 1952, left September 1 to take up his new duties as staff member of the Traverse City State Hospital, Michigan.

* * *

Dr. N. T. Norris, Caledonia, has been working with the Caledonia fire department rescue squad, training them in the proper handling of resuscitation equipment.

* * *

The American Cancer Society has named Dr. Harold S. Diehl, dean of the college of medical sciences at the

(Continued on Page A-58)

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CLYDE G. CULBERTSON, M.D., Director, Biological Research Division The Lilly Research Laboratories, Professor and Chairman Division of Clinical Pathology, Indiana University School of Medicine

JAMES G. HUGHES, M.D., Professor of Pediatrics, University of Tennessee College of Medicine

VICTOR F. MARSHALL, M.D., Attending Surgeon-in-charge, Urology, James Buchanan Brady Foundation of the New York Hospital, and Associate Professor of Clinical Surgery (Urology) Cornell University Medical College

JOHN H. MOE, M.D., Clinical Professor and Director Division of Orthopedic Surgery, University of Minnesota Medical School

CARL A. MOYER, M.D., Bixby Professor of Surgery and Head of the Department, Washington University School of Medicine

G. O'NEIL PROUD, M.D., Professor and Chairman of the Department of Otorhinolaryngology, University of Kansas School of Medicine

HYRUM R. REICHMAN, M.D., Assistant Clinical Professor of Surgery, University of Utah College of Medicine

HERBERT E. SCHMITZ, M.D., Professor and Chairman of the Department of Obstetrics and Gynecology, Stritch School of Medicine of Loyola University, Director Mercy Hospital Institute of Radiation Therapy

ERIC E. WOLLAEGER, M.D., Associate Professor of Medicine, University of Minnesota Graduate Medical School

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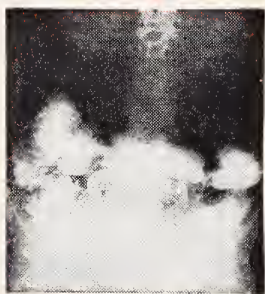
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(Continued from Page A-56)

University of Minnesota, as its chief medical and scientific officer with the title of senior vice president for research and medical affairs and deputy executive vice president. Dean Diehl will take over his new duties on November 1 and will work at first on a leave-of-absence-basis from the University, returning to the campus periodically to work on projects and assist in setting up a new administration for the medical college. His work with the Cancer Society will be concerned primarily with planning and policy, rather than routine operating duties.

* * *

A new and modern clinic building at Breckenridge, Minnesota, will be completed some time in December, according to the owners, Drs. L. T. O'Brien, C. W. Jacobson, N. R. Kippen, and C. V. Bateman.

* * *

Dr. Albert Faulconer, Jr., Rochester, has returned to this country after a tour of inspection for the Surgeon General of the U. S. Army. His trip took him to Army medical installations in France and Germany and gave him a glimpse of conditions in East Berlin. He held the official status of civilian consultant in anesthesiology to the Surgeon General.

* * *

Dr. James Sipe has joined Dr. Matt K. Plasha at the Coon Rapids Clinic. Dr. Sipe, a native of Robbinsdale, graduated from the University of Minnesota Medical School in 1955.

* * *

Dr. H. B. Roholt, former Fosston physician, has returned to his practice in that city. He has been with the U.S.A.F. medical squadron stationed at Madison, Wisconsin, and in general practice in Rye, New York.

* * *

Dr. O. W. Scholpp, Hutchinson, was presented with his pin for fifty years of medical practice in Minnesota at a recent ceremony. Dr. Charles Sheppard, as fourth district councilor for the state medical association, made the presentation.

* * *

Dr. Harold A. Wentz, Rochester, has been appointed to the Minnesota State Board of Health. He will replace Dr. Harold C. Habein, also of Rochester.



Dr. James Cain has replaced Dr. J. Arnold Borgen on the state board of medical examiners. Both are from Rochester.

* * *

Dr. John W. Heinz has joined the Davis Clinic in Wadena. A graduate of St. John's College, Collegeville, Minnesota, Dr. Heinz received his medical education at Loyola University of Chicago.

* * *

Dr. R. L. Baird, formerly of Lake Crystal, has moved his practice to St. Paul.

* * *

Dr. J. M. Stickney, Rochester, discussed "Management of the Anemic Patient" at a recent meeting of the Red River Valley Medical Society held at Sidney's Cafe in Crookston.

* * *

Dr. Milton Hurwitz, St. Paul, has been elected president of the Minnesota Heart Association to succeed Dr. Robert L. Parker, Rochester. Dr. Karl W. Anderson (Continued on Page A-60)

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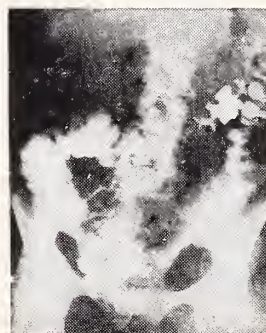
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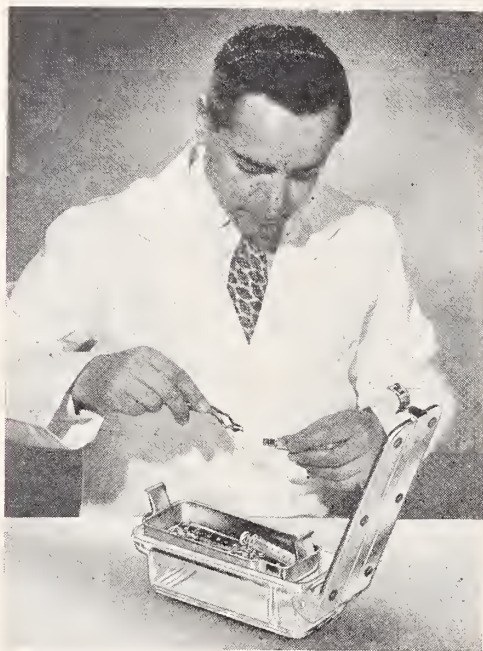
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(Continued from Page A-58)

son, Minneapolis, is vice president, and Dr. Robert A. Good, Minneapolis, secretary-treasurer.

* * *

Dr. Alvin E. Berglund, Jr., has become associated with the Cambridge Clinic. A graduate of the University of Minnesota Medical School, Dr. Berglund will specialize in obstetrics and gynecology.

* * *

Dr. Wesley W. Spink, University of Minnesota, spoke at the recent quarterly meeting of the Park Region District and County Medical Society held at the Hotel Wahpeton in Fergus Falls.

* * *

Dr. Robert N. Watson has joined his brother, Dr. Virgil A. Watson and Dr. William C. Dodds in the practice of medicine in Detroit Lakes. Dr. Watson specializes in pediatrics and internal medicine; he is a graduate of the University of Illinois Medical School in Chicago.

* * *

Heart research grants totaling \$201,057 have been announced by the Minnesota Heart Association. University of Minnesota recipients include Drs. H. Mead Cavert, Richard A. DeWall, Robert A. Good, Ancel Keys, Henry L. Taylor, Alan Thal, Louis Tobian and Richard Von Korff. Others are Dr. W. F. Mazzitello, St. Paul, and Dr. W. O. Lundberg, Austin.

* * *

Dr. Charles A. Owen, Jr., Rochester, spoke on radioactive fallout at a recent meeting of the Rochester Rotary Club.

* * *

Dr. William J. Byrne and Dr. J. P. Williams have joined the staff of the Mesaba Clinic in Chisholm. Dr. Byrne, a graduate of the St. Louis University School of Medicine, has been in practice in Browerville, Minnesota. Dr. Williams is a 1956 graduate of the University of Minnesota Medical School.

* * *

Dr. Jurgen Moller, former resident physician at St. Luke's Hospital in St. Paul, has become associated with Drs. Murray Hunter and Anthony Field in Farmington. Dr. Moller received his medical training in Germany and has practiced there and in Sweden.

* * *

Dr. James K. Heid, a graduate of the University of Minnesota Medical School, has joined the staff of the Little Falls Medical Center. He has just completed a residency at the Sacramento, California, County Hospital.

* * *

The Minnesota Surgical Society held a meeting in Duluth in July. Scientific sessions were produced by local members under the guidance of Dr. Kenneth A. Storsten. New officers of the society are Dr. Owen G. McDonald, Duluth, president; Dr. David P. Anderson, Austin, vice president, and Dr. Oliver H. Behrs, Rochester, secretary-treasurer.

Dr. Byron H. Armstrong, who maintains a private practice limited to dermatology in Hopkins, for the past few months has been spending each Monday and Thursday seeing dermatologic patients at the Mankato Clinic, Mankato, Minnesota.

* * *

Dr. Albert V. Stoesser, of the Department of Pediatrics, University of Minnesota, was guest speaker at the first fall meeting of the Aberdeen District Medical Society held at the Sherman Hotel in Aberdeen, South Dakota, September 4. The subject of his paper was "Allergic Diseases of Children and the More Recent Methods of Management."

* * *

Dr. Thomas E. Dredge, director of professional services at the Veterans Administration Hospital at St. Cloud, Minnesota, will succeed **Dr. Benjamin F. Jackson** as manager of the Veterans Hospital at Tomah, Wisconsin.

* * *

Dr. Kenneth W. Douglas, superintendent of the Sandstone State Hospital, resigned August 15 to take a similar position at the Mt. Pleasant, Michigan, Home and Training School.

* * *

Early in July, **Dr. Alvin E. Berglund, Jr.**, joined the staff of the Cambridge, Minnesota, Clinic, where he will be associated with **Drs. G. E. Larson, R. C. Magnuson, and P. H. Hedenstrom**. **Dr. Berglund**, a University of Minnesota Medical School graduate, will confine his practice to obstetrics and gynecology.

* * *

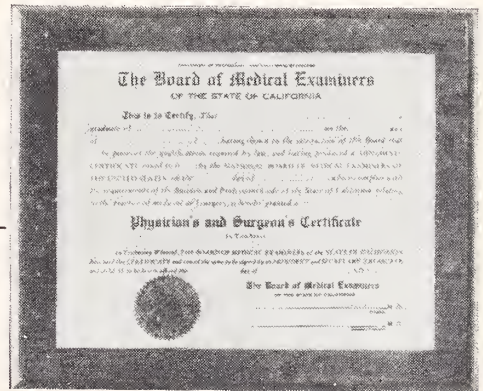
Two University of Minnesota surgeons have been honored for their contribution to the Cine clinic program of the American College of Surgeons. A plaque was presented by the American Cynamid Company to **Drs. Owen Wangenstein and Stuart Arhelger** for a motion picture on surgical techniques in cancer treatment, used as a teaching film in hospitals.

* * *

Dr. Horatio B. Sweetser, president-elect of the Minnesota State Medical Association, has been appointed chairman of a fifteen-man state advisory committee on prevention and control of Asian influenza. **Dr. Robert N. Barr**, executive officer of the state board of health, stated that the committee members were selected because of their special medical, technical, and public health qualifications. Members of the committee are: **Drs. Karl R. Lundeberg**, Minneapolis commissioner of health; **Gaylord W. Anderson**, director of the school of public health, University of Minnesota; **William F. Scherer**, associate professor of bacteriology and immunology, University of Minnesota; **Herman E. Drill**, Hopkins; **Mr. Frank W. Moudry**, secretary, Minnesota State Board of Pharmacy; **Drs. Thomas B. Magath**, Mayo Clinic; **J. A. Borgen**, Mayo Clinic, president, Minnesota State Medical Association; **Charles G. Shepard**, Hutchinson; **Benjamin W. Mandelstam**, president, Minnesota Hospital Association; **Albert E. Ritt**, Saint Paul; **Robert P. Buckley**, Duluth; **Viktor O. Wilson**, Rochester-Olmsted County health officer; **R. B. J. Schoch**, Saint Paul health officer; and **Mario Fischer**, Duluth health officer.

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MINNESOTA BLUE SHIELD-BLUE CROSS

Payments to physicians by Minnesota Blue Shield during the first half of 1957, exceeded by more than \$880,000 the amount paid for physicians' services to participant subscribers during the first half of 1956. From January 1, through June 30, 1957, Blue Shield paid \$4,218,673 for medical, surgical, obstetrical and related services rendered participant subscribers compared with \$3,337,492 paid for these services during the first six months of 1956. Blue Shield payments for physicians' services to participant subscribers during the first half of 1957 show average monthly payments of more than \$703,000. During no other six month period in Minnesota Blue Shield's history have total payments equaled the amount paid during the first half of 1957.

During the first six months of 1957, Blue Shield provided benefits for 149,359 doctors' services to subscribers. During the same period of 1956, Blue Shield paid physicians for 116,716 services rendered participant subscribers. The number of physicians' services for which Blue Shield benefits were provided during the first half of 1957 also exceeds the number of services provided Blue Shield benefits during any other similar period since Minnesota Blue Shield began operations in 1947.

If Blue Shield benefits for physicians' services to subscribers during the last half of 1957 equal or exceed the amount paid for them during the first half of 1957, Blue Shield payments to doctors during 1957 will exceed \$8,000,000 which is more than one million dollars

more than has been paid for physicians' services during any previous year.

Minnesota Blue Cross payments to hospitals totaled \$14,122,259.73 during the first six months of 1957, compared to \$11,630,990.84 for the same period in 1956. This amounted to an increase of approximately \$2,500,000.

The increase in hospital payments is attributable in varying degrees to four factors:

1. Increased enrollment. Blue Cross contracts increased from 397,518 as of June 30, 1956 to 424,873 in effect as of June 30, 1957 . . . an increase of approximately 6.9 per cent. Participant subscriber increased from 1,052,272 as of June 30, 1956 to 1,120,413 as of June 30, 1957.

2. Continued trend of popularity of Blue Cross higher benefit level contracts.

3. Increased usage. The 101,666 cases paid during the first six months of 1957 represent 488 cases paid per year per 1,000 contracts in effect, or an increase of 3.6 per cent over the incidence rate of 471 cases paid per 1,000 contracts protected during the same period in 1956. (Accident and maternity cases accounted for approximately one-half of the number of cases paid in this category, while over-all surgical care accounted for the remainder.)

4. Increased hospital costs. Ancillary costs for the first six months of 1957 (operating room, approved drugs, biologicals, etc.) were 5.9 per cent over costs for the same period in 1956.

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PHYSICIANS URGED TO STUDY WORK POTENTIAL OF CONGESTIVE HEART PATIENTS

Employment horizons for cardiac patients with congestive failure are beginning to widen and their occupational potentialities merit further investigation, according to two specialists.

Dr. Leonard J. Goldwater, of the Columbia University School of Public Health and Administrative Medicine, and Dr. John M. Evans, of the George Washington University Hospital, state that refinements in diagnostic procedures and important improvements in drug therapy such as recently developed oral organomercurial diuretics have affected changing attitudes of the medical profession. They write in the journal *Industrial Medicine and Surgery* (26:182, 1957).

"The idea that persons having heart disease are able to work, and that they can be employed in a variety of jobs, is by no means new," they begin. Yet, "In spite of a rather voluminous literature, there rarely has been any mention of the employment of individuals having congestive heart failure." They do refer to several publications of recent years.

Physicians have been less restrictive in their advice, and the general public has become less apprehensive about the dangers of heart disease, it is stated. "The major efforts in public education, particularly those connected with fund raising, have shifted their emphasis from the 'scare' technique to that of pointing out the positive and hopeful aspects."

Thus far, somewhat limited study indicates that no diverse effects occur when persons with heart disease are intelligently placed at work and remain under competent medical supervision, the authors add.

"The physician now has at his command an array of therapeutic agents which singly or in combination assist the ailing heart to carry on. Where congestive failure has occurred, it is usually necessary to employ a digitalis preparation and one or more diuretic agents.

"Recently developed oral mercurial diuretics appear to be an important addition to the physician's therapeutic armamentarium since, among other things, they reduce the necessity for frequent diuretic therapy."

The authors include a few illustrative case histories of people who have carried on active occupational lives despite congestive failure. One is a mechanic at an airport, "frequently working overtime with no difficulty." Another is a social worker with considerable travel. Therapy in these and other cases is said to include the oral organomercurial Neohydrin, low salt diet and digitalis.

RECOMMENDED: A GOOD CRY

Men might live longer if, like women, they could have a good cry now and then, or some male equivalent, suggests Dr. James O. Bond of the Florida State Board of Health. Perhaps men "need to learn more from women either how to avoid emotional tension or deal with it in less damaging ways than development of coronary artery disease," he said. Greater stress, or less relief from it, is only one possible explanation why men do not live as long as women. Women are more ready to acknowledge illness early and seek treatment for it, he added.—American Chemical Society, Miami.

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ASSISTANT WANTED—Very active general practice in Central Minnesota. New, excellent hospital in town. New clinic building. Good hunting and fishing. Address E-594, care MINNESOTA MEDICINE.

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Original Contributions

Rational Therapy with Tranquilizing Drugs

A Psychiatrist's Views

ROBERT L. FAUCETT, M.D.
Rochester, Minnesota

THE age of tranquility is indeed upon us. The advent of a whole new class of drugs in the past five years has created a great surge of interest in the chemical control of the symptoms of mental illness, and of the disrupting effects of anxiety and tension. Mankind long has sought such an elixir and has tried alcohol, hashish, the poppy seed and, more recently, bromides and barbiturates as the answer to these disagreeable sensations. None of these agents have sufficed. They may change man's awareness of the harsh and unpalatable realities of his past and present, but they have been of no help alone in dealing with these facts realistically and indeed often have compounded the problem. The tranquilizers represent a new addition to the physician's therapeutic assets but, as with any other therapy, they must be used with rationality and perspicacity.

The drugs were first tried on patients in state hospitals and the dramatic effects on violent, assaultive, out-of-contact, overactive, psychotic patients have led to such florid predictions in the public press as follows from the *New York Times Magazine*:

"The dramatic, even miraculous, results of treating insanity with the so-called 'tranquilizing' drugs in recent years have confirmed the poet's intuitive understanding of the dark curtain which so often shuts human minds away from reality. This is the story of a promise of a new age when most cases of insanity can be controlled by combinations of drugs, as diabetes, for example, is now controlled by insulin."

Such outbursts of unfounded optimism, supported by uncritical clinical trials and sustained by tons of commercial advertising, the extravagant claims

Dr. Faucett is in the Section of Psychiatry, Mayo Clinic and Mayo Foundation.

The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.

of a few vocal proponents and pharmaceutical advocates, and the wistful hopes of the practitioner for something to help the clamoring neurotics whose symptoms he does not understand and often does not wish to hear, have catapulted these drugs into fourth place in dollar volume in medical practice today, even threatening the old favorite, the laxatives, with an estimated expenditure in 1957 of \$125,000,000. Even with the plethora of preparations presently available, there are estimated to be about forty such drugs now in clinical trial that have not been released to an uncritical public.

While these drugs do have remarkable effects in certain circumstances, the above facts require a sober second look and a consideration of the possibility that such agents frequently are prescribed to preserve the tranquility of the physician instead of the patient. The continued uncritical use of a class of drugs frequently brings about a reaction of overgeneralized pessimism that obscures their real value.

Current Concepts of Mental Disease as Related to Tranquilizers

Man is a symbolizing, remembering animal, biologically and socially dependent on the protectiveness of his environment for a long time after birth. During this period, he develops personality techniques and operations to deal with the forces in this environment that threaten his well-being. These techniques, by operation of the general principle of economy of energy, tend to become automatic or unconscious but always are directed toward minimizing the intolerable effects of anxiety. Because these personality techniques or defense systems become automatic, a misperception of current reality distorted by past experience often occurs; when the system is inadequate to allow a person to face present problems, regression to more

primitive and infantile modes of behavior may occur. These maneuvers, because they occur automatically and unconsciously, are frequently not a good adjustive technique and anxiety or aberrant behavior occurs, usually in proportion to the emotional trauma or deprivations of early life.

The stress that brings about abnormal anxiety or aberrant behavior or somatic manifestations may be quantitative, as was seen in combat neuroses in which it was learned that every man has his breaking point, or it may be qualitative, in that the stress objectively does not look overwhelming but, because it is specifically reminiscent of past traumatic events, causes overdetermined reactions. Such stresses bring about the decompensation of previously adequate defense systems and the appearance of anxiety or other manifestations. On the other hand, the defenses against anxiety may be of borderline effectiveness throughout life, and consequent constriction of the personality may be seen. This constriction of personality minimizes the flexibility and resiliency of the person to meet the ordinary stresses of living and so he lives in a constant state of fearful apprehension. Any treatment that presumes to deal with anxiety or neurotic or psychotic manifestations without taking these facts into account is irrational, whether successful or not.

This concept of mental illness also makes it apparent that drugs alone will not likely "cure" or even manage the symptoms of mental illness. It does point a way, however, in which drugs can be an invaluable part of an over-all plan of management.

Zeller and associates¹ have commented as follows:

"Because of the rather specific action that these drugs have upon certain areas of the brain, they seem to produce an effect similar to that seen in patients with lobotomy. Some have described this effect as a peculiar insulation of the patient against incoming stressful stimuli from the environment. From the psychodynamic standpoint, such an insulating effect is important. Stressful stimuli arising from within or from without the individual usually evoke anxiety, and each individual handles his anxieties according to previously learned ideational and behavioral responses. If the emotionally upset patient can be guarded against incoming stressful stimuli that potentially can further upset the homeostasis of his internal environment, he will be better able to mobilize his previously learned defenses and coping mechanisms in order to handle more efficiently the anxiety or affect evoked by the forces that threaten him from within and from without."

Usefulness of Tranquilizers

The cogent description just quoted points the way toward the usefulness of these drugs but indicates that they only provide time for the patient to mobilize his assets, time for the stressful situation to subside or time for the physician to provide psychotherapeutic help, whether it be supportive, re-educative, manipulative, uncovering or reconstructive, as in psychoanalysis.

Drugs alone are not the answer to the management of anxiety or emotional illness, but management should be directed simultaneously toward several aspects of the total situation. A major factor in this is the performance of the physician. The physician who fails to undertake to understand the totality of the situation cannot distinguish between the assets and liabilities inherent in it; he will find it necessary to administer drugs and, because he offers nothing else, he tends to make the use of drugs essential to his patient. On the other hand, the wise physician will administer drugs as a specific part of the physician-patient relationship and not as a substitute for it. The need for this interpersonal contact is even becoming apparent as these drugs make their effect felt in state-hospital populations; as they make patients accessible to interpersonal relations, the patients are able to participate in their treatment. This challenges the hospital personnel to provide opportunities to exploit this participation in order to hasten and solidify improvement. Many physicians consider that this is the most important therapeutic effect of the drugs.

Rational use of drugs thus requires a rational plan of management. This means that data must be accumulated and a history taken. The physician must determine whether events leading to the incapacity are quantitative or qualitative, and he must judge how long the noxious events will be operative and whether they can be manipulated. He cannot expect drugs to make the patient better adjusted than he was before the symptoms commenced. He must determine whether the situation is one that will be temporary by its nature and must judge the acuteness of its onset.

Three groups of situations typify those in which drugs will be a most valuable adjunct. The first group includes acute situations in which the sudden interposition of stress is clearly apparent and temporary in nature, especially as a result of illness or medical or surgical intervention. This is seen most sharply in postoperative psychosis or in

disrupting metabolic disease. In these situations, tranquilizers are at their brilliant best, although even here they do not replace intelligent and humane nursing care. These drugs are also valuable adjuncts when narcotics must be resorted to for the management of pain; their use will avoid to some extent the dangers of development of tolerance or addiction.

The second group includes situations in which clearly apparent changes are present in the interpersonal situation that have acutely precipitated the patient's anxiety but that are temporary in nature, such as financial catastrophes, family disruption or accidents, or in which events that specifically challenge previously adequate defense systems have occurred and in which time (not more than four to six weeks) may be necessary for integration and readjustment to occur.

Finally, there are situations in which the anxiety has reached such high levels as to disrupt or threaten to paralyze the patient's adaptive responses. This is frequently the situation in ambulatory psychotic patients who have threatening panic reactions or all-pervading pananxiety.

It has been my experience and that of my associates that these drugs are usually of minimal value when symptoms other than tension and anxiety have appeared, such as conversion hysteria, somatic delusions or other somatized anxiety, or when the anxiety has continued long enough to lead to organized neurotic symptoms such as phobias, obsessions and paranoid ideas. They are useless in depressions, often actually making the patient worse. There are certain kinds of tense, dependent, rôle-playing persons whose adjustive technique is solely in placating their environment. To do this, they depend on cues received from those around them. Since tranquilizers blur organized perceptual cues somewhat, these drugs may actually make such patients worse and precipitate more insomnia and anxiety or even depressive reactions. Many hypochondriacal patients

will incorporate the side effects of the drugs into their symptomatology, thus making the situation even more complicated.

Mention should be made of the side reactions of drowsiness, with its consequent dangerous effects on the ability to drive automobiles, cutaneous rashes, jaundice, parkinsonism and the precipitation of depression. As already indicated, the factor of cost also must be considered.

Conclusions

A number of principles must be kept in mind when the so-called tranquilizers are being prescribed. These factors include the following admonitions:

1. Collect the data that offer leads to the cause of the anxiety.
2. Devise a rational plan of management that attacks several aspects of the situation simultaneously.
3. Do not prescribe tranquilizers for your own peace of mind.
4. Consider doing nothing.
5. Ask psychiatric consultation.
6. Remember that these drugs are costly and not entirely harmless, and that living continuously in a chemical strait jacket does not constitute a desirable way of life.
7. Keep in mind that administration of drugs cannot remedy the defects of human personality that plague people most, such as dependency, irresponsibility, meanness and lack of respect for the rights of others.

When asked his opinion of the "don't give a damn" drugs, Dr. Karl Menninger said, "Society would be better off if someone invented a 'do give a damn' drug."

Reference

1. Zeller, W. W., Graffagnino, P. N., Cullen, C. F. and Rietman, H. J.: Use of chlorpromazine and reserpine in the treatment of emotional disorders. *J.A.M.A.*, 160:179-184 (Jan. 21) 1956.

TRANQUILIZERS VS. ARCHITECTURE

Tranquilizers have "struck a provocative blow at institutional architecture," reports *Architectural Forum* magazine. The California legislature, the magazine said, has recommended that "major expenditures on mental hospitals be postponed" until the full effect of the new drugs on design is evaluated. California lawmakers have

been advised by a special committee that tranquilizing drugs have started a new trend "away from the maximum security type of facility and toward the 'normal' hospital facility."—*South Dakota Journal of Medicine*, August, 1957.

Use of Induced Cardiac Arrest in Open Heart Surgery

Results in Seventy Patients

PETER ALLEN, M.D.
C. WALTON LILLEHEI, M.D.
Minneapolis, Minnesota

WITH the advent of extracorporeal circulation, a new era in cardiac surgery began, and for the first time it became possible to open the diseased heart without fear of ventricular fibrillation and without being harassed by limitation of operating time. However, while extracorporeal circulation solved these obstacles and has made curative surgery possible for the first time for ventricular septal defects, atrioventricularis communis tetralogy of Fallot and a variety of other cardiac malformations,^{1,2} at the same time other problems became evident.

When the interior of the by-passed heart is exposed by cardiotomy, the continued activity of the myocardium sometimes makes accurate repair of the defect difficult. Furthermore, the operative field may be obscured by blood from the coronary sinus passing into the right ventricle, by bronchial collateral circulation either passing retrograde from the pulmonary artery or flowing into the left heart via the pulmonary veins and across a ventricular or auricular septal defect. Lastly, blood may obscure the field by spilling across the aortic valve which, even though normal, often exhibits varying degrees of incompetency during total body perfusion.

To reduce in quantity blood obscuring the intracardiac field during surgery, a Rumel tourniquet often has been used to constrict the ascending aorta just distal to the coronary ostia.² Thus, by intermittent aortic occlusion, inflow of blood from the coronary sinus and reflux through the aortic valve was prevented. This method has proved valuable and is still utilized frequently for the simpler intracardiac procedures, but the persistent myocardial activity may make accurate surgical repair of some less accessible septal defects difficult and occasionally incomplete.

In 1955, Melrose³ described chemically induced cardiac arrest as an adjunct to open heart surgery. The heart could be stilled, its metabolism lowered, the surgical field dried and danger of air embolism greatly reduced. Several arresting drugs have been used experimentally but only two, to date, acetylcholine and potassium citrate, have seemed to fulfill the properties of an effective cardioplegic agent for human use; namely, the rapid induction of complete cardiac standstill, rapid restoration of sinus rhythm with reperfusion of the coronary arteries and, thirdly the absence of systemic toxicity to the drug. Lam,⁴ has favored the use of acetylcholine, and Effler and associates⁵ potassium citrate to induce cardiac arrest. At the University of Minnesota Hospitals both potassium citrate and acetylcholine have been employed.

Sidney Ringer,¹⁰ in 1883, first recorded depression of the myocardium when potassium chloride was added to the perfusing fluid of an isolated heart, but at the same time he was unaware of the mechanism involved.

If one takes a single resting cell as the example, the outside of the cell membrane contains positive charges and the inside, negative charges which result in the cell having a negative electrical potential of about 90 millivolts. When the cell is stimulated to contraction, sodium passes into the cell and potassium is passed outward into the extracellular compartment. If the extracellular potassium concentration is increased by the injection of potassium citrate, then potassium within the cell is no longer able to pass outward against the high concentration. The citrate ion by combining with calcium further augments this effect because of the reciprocal relationship between calcium and potassium ions. The result is increased positive charges within the cell from the retained intracellular potassium, the negative electrical potential of the cell is thus

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rapidly reduced toward zero potential and is unable to respond to further stimulation until the extracellular potassium concentration is reduced. It is then possible for positively charged potassium ions to pass out of the cell and restore the negative intracellular potential. However, while the cell is thus functionally inactive, its metabolism continues and, indeed, Rohde⁶ has shown that the oxygen consumption of the potassium arrested heart is reduced by only 50 per cent over the beating, non-working heart.

Cardiac arrest induced by acetylcholine, in contrast to potassium asystole, does not act by reducing the negative electrical potential of the myocardial cells but blocks neural impulses at the myoneural junction and prevents cardiac contraction. Normally, the response to stimulation of cells of the myocardium is due to the release of acetylcholine at the myoneural end plate. This chemical substance bridges a synapse between nerve and muscle fiber and allows the neural impulse to produce a muscular contraction. Subsequently, cholinesterase rapidly hydrolyses acetylcholine to choline and acetic acid; as a result, the synaptic membrane is repolarized and able to respond to successive neural impulses. When the coronary arteries are perfused with acetylcholine, the myoneural end plate becomes rapidly depolarized and, as there is insufficient cholinesterase to hydralize or break down the greatly increased concentration of acetylcholine, the end plate cannot transmit further impulses. Consequently, succeeding nerve impulses to the myocardium produce no response until the heart is reperfused with oxygenated blood, excessive acetylcholine is washed out, and the myoneural junction is once again repolarized.⁷

Cardioplegic drugs are administered by rapid injection into the ascending aorta just proximal to a clamp placed distal to the ostia of the coronary arteries (Fig. 1). Action of the myocardium ceases quickly; it remains dormant until the aortic clamp is removed and oxygenated blood, perfusing the coronary arteries, washes out the paralyzing drug.

Acetylcholine, diluted in normal saline and injected at a concentration of 10 mgm. per kilogram of body weight, produces cardiac arrest, but a single contraction will occur each time the myocardium is touched. In using potassium asystole, it was found that the higher the concentration of potassium used or the greater the

duration of arrest, the longer it took to resuscitate the heart once coronary perfusion was restarted. At present, a 2.5 per cent solution (25 mgm./cc.) is used and is prepared by expanding a 25 per

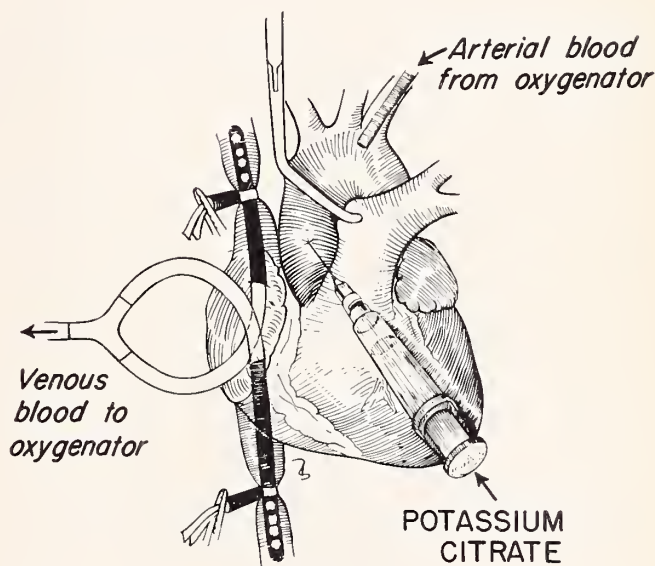


Fig. 1. Method for inducing complete cardiac arrest to facilitate reparative surgical procedures during total cardiopulmonary bypass utilizing the pump-oxygenator.

cent solution of potassium citrate with the patient's own blood.³ The upper limit of safety has not been established, but a solution of less than 1 milligram per cc. (0.1 per cent solution) will not produce cardiac arrest.

Results

The average amount of 2.5 per cent potassium citrate solution needed to produce asystole in our cases was 33 cc., most of the pediatric patients requiring only 10 to 25 cc. The greatest volume used was 100 cc. in an adult with aortic insufficiency. The average duration of cardiac arrest utilizing potassium has been eighteen minutes, the longest being thirty-five minutes (successful)* With acetylcholine, the average duration of asystole has been seven minutes and the longest was thirteen minutes. Contrary to the policy of some, we have not induced cardiac arrest routinely in cases undergoing intracardiac surgery, but rather have reserved its use for patients where myo-

*An additional patient, not included in this series because no cardioplegic agent was utilized, had an uncomplicated recovery from an anoxic arrest period of thirty-three minutes during which a ventricular septal defect was closed and the transected aorta was reanastomosed just above the coronaries. Upon resumption of the coronary flow in this patient the deeply cyanotic myocardium fibrillated, but resumed a spontaneous sinus-rhythm before an electrical shock could be given.

cardial activity or excessive blood in the field obscured vision and increased the possibility of an incomplete repair. This decision is made after the heart has been opened and the pathol-

patients are progressing well several months after surgery in spite of persisting complete A-V dissociation. Five patients have died, all from the adverse effects of heart block.

TABLE I. POTASSIUM CITRATE INDUCED ASYSTOLE AS AN ADJUNCT TO OPEN CARDIOTOMY WITH THE PUMP OXYGENATOR

Lesion	No. Patients	Deaths (All Causes)	Complete Heart Block				Unable to Restart Heart
			No.	Died of Block	Reverted to Sinus Rhythm	Permanent	
Ventricular septal defect	31	7	7	3*	2	2	0
Tetralogy of fallot	23	6	7	2	5	0	0
Ruptured aneurysm of sinus of valsalva	2	0	0				
Aortic regurgitation†	2	2					2
Single ventricle	1	0	1		1		
Totals	59	15	15	5	8	2	2

*One of these deaths was late (three months postoperatively) in a patient whose defect was completely closed.
†One patient had a small ventricular defect also.

TABLE II. ACETYLCHOLINE ASYSTOLE AS AN ADJUNCT TO OPEN CARDIOTOMY WITH THE PUMP OXYGENATOR

	No. Patients	Deaths	Complete Heart Block
Ventricular septal defects	5	0	0
Aortic stenosis	6	1*	0
Total	11	1	0

*Calcific aortic stenosis

ogy assessed, thus further reducing the duration of asystole needed. At the University Hospitals in Minneapolis, induced asystole has been used in this manner in seventy patients to facilitate difficult exposures and to expedite the repair of isolated ventricular septal defects or those seen in tetralogy of Fallot. These seventy cases include patients with a variety of congenital and acquired cardiac lesions (Tables I, II).

In this center, the increased incidence of persisting complete atrioventricular dissociation following completion of potassium arrest has been a deterrent to its use in every case of intracardiac surgery where asystole might be convenient. Moreover, in two patients both with aortic valvular disease it was impossible to restart their hearts after only brief intervals of potassium arrest of four and eleven minutes, respectively.

In our series (Table I), there were fifteen cases (25 per cent) of persisting complete heart block (complete atrioventricular dissociation) following potassium arrest in surgery. Eight have reverted to sinus rhythm usually within seven days. Two

In the first 165 patients undergoing operative repair of a ventricular septal defect (includes tetralogy of Fallot and atrioventricularis communis patients) before induced cardiac arrest techniques were available, nineteen (11.5 per cent) developed complete heart block which persisted following surgery. Fourteen died as a direct result of heart block, four reverted to sinus rhythm, and one is alive eighteen months later with complete heart block and an apex rate of forty-five to fifty beats per minute.

Discussion

To date, at the University of Minnesota Heart Hospitals, 360 patients have had total cardiopulmonary bypass for intracardiac surgery utilizing extracorporeal circulation. Two hundred and twenty-five of these patients were operated upon before induced cardiac asystole was available, and the remaining 135 since. Upon the basis of this experience it is clear to us that the use of cardioplegic agents has been a great help in allowing improved exposure of less accessible ventricular septal defects and facilitating a complete, durable repair. However, the increased incidence of immediate complete heart block in these patients cannot be disregarded. When septal defects are repaired in an actively beating heart, occasionally (six cases in 165) the offending suture responsible for heart block is observed and its removal may restore normal rhythm. However, when the heart is arrested, it is impossible to observe the offending suture, and complete A-V

dissociation may be observed only after the heart beat is restored.

To some extent this undesirable sequel of arrest techniques has been offset by vastly improved treatment of surgical heart block. The drug Isuprel[†], which increases ventricular rate by direct action on the myocardium⁸, has decreased the mortality of this complication from almost 100 per cent to about 50 per cent.

More recently, when operative heart block persists, a fine silver-plated copper wire sutured into the myocardium of the right ventricle, brought out on the chest through a minute stab wound and connected to an electrical cardiac pacemaker, has been used to maintain a ventricular rate of 100-120/minute during the critical postoperative period the voltages required are low (2 to 5 volts), the control of the heart rate is complete, and the patient is unaware of any unpleasant shocks as occur with the external pacemaker. We have usually continued to use Isuprel in conjunction with the electrical pacemaker in cases of persisting heart block following surgery, so that in the early postoperative period, if the pacemaker for some reason should fail, Isuprel may maintain a satisfactory apex beat. Conversely, as the Isuprel gradually becomes less effective, the electrical pacemaker continues to maintain a satisfactory ventricular contraction. As a rule, if sinus rhythm has not occurred within a week to ten days, spontaneous idioventricular contractions begin to interfere with the action of the electrical pacemaker, ventricular action becomes irregular, and the electrical stimulator is best terminated. In such cases, Isuprel usually continues to have some effect on the heart beat, but gradually the apex rate slows to 50 to 70 beats per minute, the reduced rate being compensated by an increased stroke volume. By this form of therapy the acute mortality of complete block has fallen to virtually zero.

Although it has been difficult to quantitate because of the multitude of factors involved, the "arrested" patients appear to have had a greater incidence of tachycardia in the immediate postoperative interval. For most, but not all, of the patients this arrhythmia appears to have been a non-fatal complication.

The reader may be tempted to compare the results (Tables I, II) of the use of potassium citrate and acetylcholine. However, these two series are

not comparable at all neither from the standpoint of the number of cases involved nor from the types of cases in which these agents have been used. For, it is our conclusion based upon this experience, that these two cardioplegics are not competitors. Each, it appears, has a role of value with perhaps some, but relatively little overlapping.

Potassium citrate injection produces immediately a completely flaccid heart totally unresponsive to any mechanical stimulus and thus has been of most value in difficult anatomical problems where complete relaxation is desirable often for a relatively long period. The successful single ventricle repair in this series would not have been possible without arrest and would, in our opinion, have been very difficult in the more responsive acetylcholine arrested heart. Moreover, hearts arrested with potassium show a slower return to their contracting state. Possibly this is a result of the profound nature of the arrest and the time necessary for the potassium to move out of the cells. However, the persistence for some hours of a hyperpotassemia pattern in the electrocardiograms of some of these patients suggests that the effects are not immediately and completely reversible.

Thus, in the present state of our knowledge, we believe it better to avoid using potassium arrest, if possible, in patients with extensive myocardial damage from any cause, those with a relative coronary insufficiency such as exists in far advanced lesions of the aortic valve with extensive left ventricle hypertrophy, or in patients with appreciable coronary arteriosclerosis present. Intracardiac procedures requiring cross clamping of the aorta in such patients may be better managed by retrograde perfusion of the coronary sinus with or without a cardioplegic agent added⁹.

Acetylcholine, on the other hand, produces a less profound degree of arrest. The heart after receiving the agent into the coronary circulation often continues to beat for a minute or two at a slower rate before complete asystole occurs. This fact has suggested that in part the arrest may be anoxic, but this is conjectural at present. These acetylcholine arrested hearts, so to speak, are "straining at the bit." They will respond to each mechanical stimulus of the myocardium by a contraction. Moreover, acetylcholine is unstable and its effects are more quickly reversed by the restoration of coronary perfusion. In addition, atropine, a potent antidote, is available if needed. These characteristics of acetylcholine arrest have

[†]Available from Winthrop-Stearns Company.

made it particularly valuable in patients with advanced aortic valvular disease where the left ventricular hypertrophy has exceeded the available coronary artery blood supply and a significant degree of coronary insufficiency exists.

Moreover, acetylcholine has been of value also in relatively simple ventricular defects where a few minutes of asystole was deemed very helpful and convenient, but in which the profound degree of arrest characteristic of potassium was not necessary.

In conclusion, the use of cardioplegics to stop temporarily the beat of the heart with concomitant clamping of the coronary arterial flow allows full realization of one of the major goals of open heart surgery; namely, an operative field which is both dry and motionless. Although these agents have a measurable morbidity and mortality related to their use, recognition of these limitations together with their use in selected patients where vital to complete repair has contributed along with a number of other factors to a further significant lowering of the risk of open heart surgery. Thus, in the last forty consecutive open heart operations carried out by the authors utilizing total cardiopulmonary bypass with the pump-oxygenator and for a variety of cardiac lesions such as listed in Tables I and II, there has been only one death (2.5 per cent). Seventeen of these forty patients had potassium arrest with six complete heart blocks occurring (all reverting later). The one death occurred in this potassium arrested group, but was not related to the arrest in this patient. Eight of these forty patients were arrested with acetylcholine with no blocks or deaths. The re-

maining fifteen patients had no arrest measures used during reparative surgery with two complete blocks occurring (reverting later) and no deaths.

Acknowledgment

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HELP IN TREATING PLANTAR WARTS GAINED FROM X-RAYS

The incidence of plantar warts has increased in recent years, possibly due to more participation in sports by recreation-minded Americans, and treatment by x-rays of these growths has produced gratifying results.

This is the report of a physician associated with the Duke University Medical School in Durham, North Carolina. He is Dr. Robert J. Reeves, and his report on plantar warts, which apparently are caused by a virus infection and occur most often on the ball of the foot, appeared in the November, 1956, issue of *The American Journal of Roentgenology, Radium Therapy and Nuclear Medicine*.

"The incidence of plantar warts has appeared to increase in recent years, possibly due to increasing popularity of sports and the frequent use of public shower baths and locker rooms—and this may also account for

the increasing frequency in persons of high school and college age," Dr. Reeves pointed out.

Other conclusions by the North Carolina radiologist:

Gratifying results from the use of x-rays have led to general acceptance of this method, which is painless in application and usually produces little discomfort.

In one series of 208 patients reported, there were excellent results in 98 per cent.

If the radiation treatment should fail, Dr. Reeves advised against retreating the area with irradiation.

The symptoms of plantar warts vary from the sensation of a pebble in the shoe to marked disability, and treatment has often been delayed because of failure to recognize the condition or because of the indiscriminate use of such corrective measures as acids, frequent parings and callus file.

Pitfalls in Electrocardiographic Interpretation

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DEFINING the pitfalls of electrocardiography constitutes an undertaking readily extended into every phase of electrocardiographic interpretation. If one is to avoid exhaustion, this discussion must be of a disciplined and selective sort that leads but a short way into what is hoped may prove to be a few of many rewarding byways. In order to lend some form and continuity to matters naturally incohesive, I have arranged this presentation under six headings.

The Human Comedy

*"When we are born, we cry that we are come
To this great stage of fools."†*

Technical errors can be a source of confusion in electrocardiographic interpretation. The modern electrocardiograph is remarkably foolproof, but necessity still demands the attachment of a specific lead wire to a designated extremity. In Figure 1 are reproduced a series of electrocardiograms from a forty-eight-year-old man. The record of April 30, 1950, was made at the time he consulted his physician because of symptoms related to nervous tension. A week later, the patient experienced an episode of pain in his thorax lasting half an hour. Although this pain was not of a character affording convincing evidence of coronary insufficiency, the possibility of posterior myocardial infarction was entertained seriously if only transiently after review of the electrocardiogram dated May 7. In the record dated May 18, all complexes were within the limits of normal. The peculiarities in form of the deflections on May 7 are such that, as compared with the record of May 18, lead I = — lead III, lead II = — lead II and lead III = — lead I. This relationship would result if, in recording the tracing of May 7, the proper attachments of the electrodes to the right arm and the left leg were

reversed. No other single interchange of extremity electrodes matches this one as a means of producing a topsy-turvy electrocardiogram.

Calling such errors "technical" is not intended to convey that all such mistakes are made by lab-

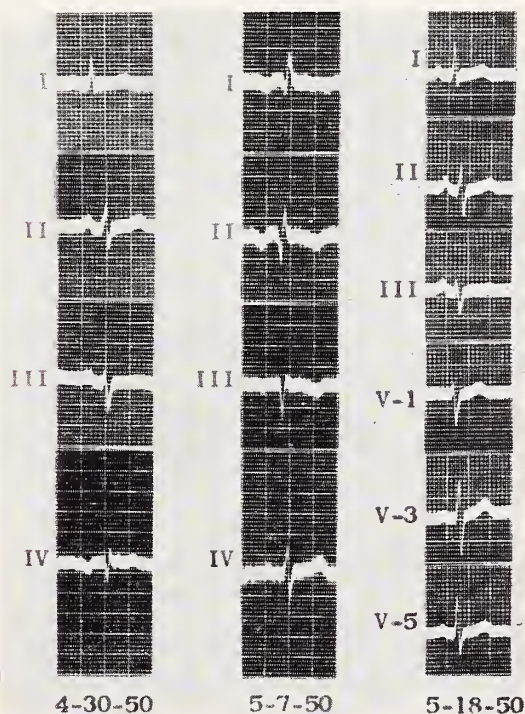


Fig. 1. In the electrocardiogram dated 5-7-50, the proper attachments of the electrodes to the right arm and the left leg were reversed. The resulting deformities in the ventricular complexes simulate those of posterior myocardial infarction. The other two tracings in this figure were made with the electrodes properly attached.

oratory technicians. The incidence of such errors is negligible among experienced technicians; however, when the physician turns in to lend a helping hand, the results may become novel and unpredictable.

Origins Are Important

*Establish first the source and
nature of ventricular excitation.*

Electrocardiographic identification of ventricular hypertrophy and localized myocardial injury

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The Mayo Foundation is part of the Graduate School of the University of Minnesota.

†King Lear: Act IV, Scene VI.

rests on analysis and interpretation of the form of the ventricular complexes. Essential to such analysis and interpretation are movement of the excitation process into the ventricles from a source

the duration of that complex. This peculiarity is believed to result from anomalous excitation of the ventricular myocardium as a consequence either of unusually rapid spread of excitation

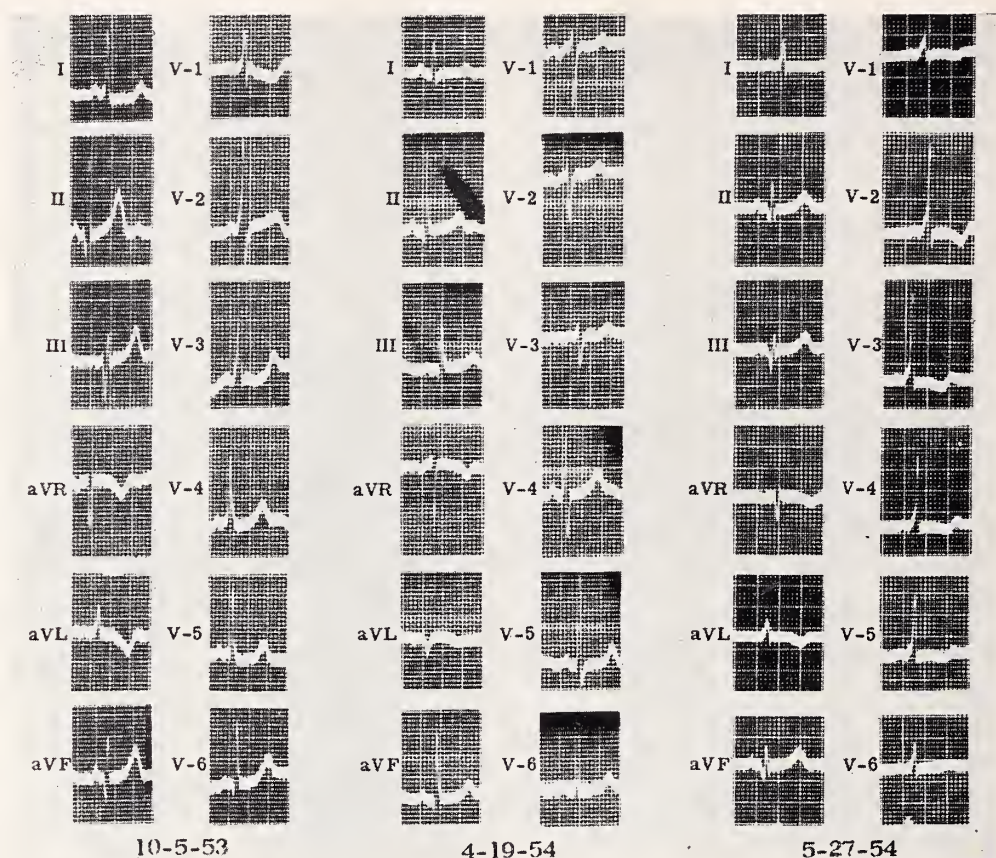


Fig. 2. Electrocardiograms recorded from a patient having the Wolff-Parkinson-White syndrome. When anomalous atrioventricular conduction occurred, as in the records of 10-5-53 and 5-27-54, QRS deformities suggestive of posterolateral infarction were present. These changes disappeared when normal atrioventricular conduction was present (4-19-54).

above the bifurcation of the atrioventricular bundle and spread of excitation through the ventricles over normally functioning bundle branches and subendocardial pathways. For example, distortion of the ventricular complexes attending idioventricular rhythms or left bundle-branch block may obscure the alterations produced by hypertrophy or destruction of myocardial fibers.

In illustration of this category of pitfalls, a series of electrocardiograms have been selected that were recorded from a twenty-eight-year-old woman who had the Wolff-Parkinson-White syndrome (Fig. 2). She was subject to paroxysms of tachycardia. Her electrocardiogram dated October 5, 1953, disclosed an unusually short P-R interval, the final portion of the P wave merging with the initial component of the QRS complex to prolong

through the usual atrioventricular pathway or rapid spread over an aberrant pathway (bundle of Kent). In this patient, anomalous excitation of the ventricles resulted in the presence of Q deflections in leads II, III and aVF, suggestive of posterior myocardial infarction. These changes, combined with a sense of precordial oppression noted by the patient during episodes of tachycardia, led to consideration of a diagnosis of posterior myocardial infarction by the attending physician. Furthermore, the form of the QRS complexes in lead V-1 might have been considered to be suggestive of right ventricular hypertrophy. That neither localized myocardial injury nor ventricular hypertrophy existed was supported by the form of deflections in a subsequent electrocardiogram dated April 19, 1954. The P-R interval had

reverted to normal, ventricular excitation occurred over the usual pathways and the ventricular complexes assumed a normal form. Recurrence of a short P-R interval in the record taken on May 27, 1954, was attended by reappearance of the peculiarities related to anomalous ventricular excitation.

The Fallacy of Half Truth

An ignorant genius may be no match for a well-informed fool.

A sound and time-honored dictum in teaching electrocardiography is the importance of taking sequential tracings during the acute phase of suspected myocardial injury. Once unequivocal electrocardiographic evidence of injury has been identified, the securing of additional records becomes a matter of lesser consequence. Judgment regarding clinical improvement and prognosis rests on evidence other than electrocardiographic.

The commonly emphasized necessity of securing adequate data at the time of suspected myocardial injury has a counterpart equally and obviously desirable but sometimes more difficult of accomplishment. When a patient presents an account suggestive of myocardial injury some months prior to initial examination by the physician currently in charge, when the currently recorded electrocardiograms are not diagnostic of injury, when the establishment of a diagnosis is important to patient and physician and when electrocardiograms taken at the time of occurrence of the suspected infarct are known to exist, these earlier tracings should be secured if possible. To do so may require patience, understanding and cooperation on the part of all concerned, but especially of the physician under whose supervision the earlier electrocardiograms were taken.

In Figure 3 are reproduced tracings illustrating the help to be had from review of records made during the acute phase of myocardial infarction. The patient was a forty-one-year-old man who did not have diabetes or hypertension.* He was subject to much anxiety, which led the clinician to reserve judgment regarding the presence of coronary sclerosis, although the patient's account was suggestive of angina pectoris. In the electrocardiogram dated September 17, 1956, tiny Q waves were present in leads II, III and aVF;

the T waves in leads V-4, V-5 and V-6 were inverted slightly in their terminal portion. This record does not afford evidence diagnostic of myocardial injury. However, on request, the physi-

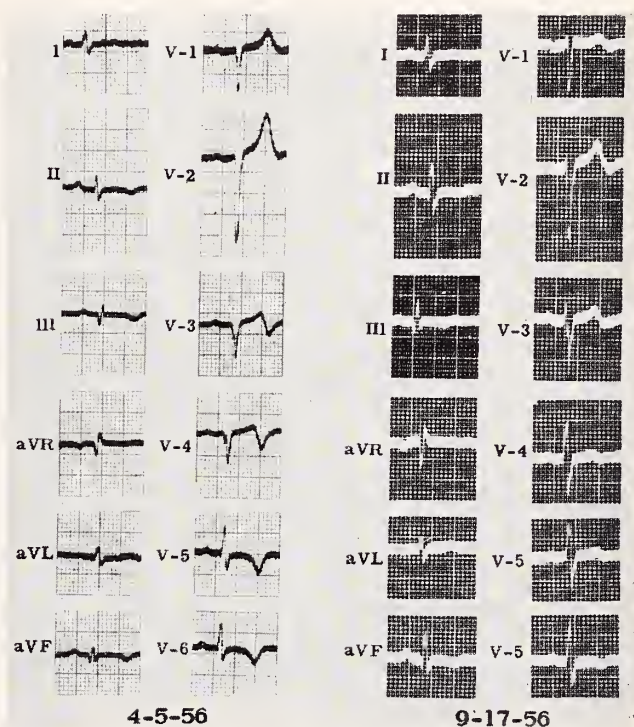


Fig. 3. The electrocardiogram of 4-5-56 affords diagnostic evidence of anteroapical myocardial injury. These changes no longer are evident in the record of 9-17-56.

cian who had attended the patient on April 5, 1956, was kind enough to send electrocardiograms of that date. These records provided diagnostic evidence of myocardial injury as manifested by absence of the R deflections in leads V-2, V-3 and V-4 and by deep inversion of the T waves in leads V-3, V-4, V-5 and V-6.

The Fallacy of Undiscerning Generalization

Like this; therefore the same as this.

The clinical applications of electrocardiography commonly rest on the proposition that complexes of a configuration known to bear consistent correlation with a specific myocardial lesion may be held indicative of the presence of that lesion. Errors in diagnosis occur in the event of (1) a faulty assumption of an unjustified correlation or (2) a rare exception to a usually valid correlation. Errors of the former type occur with decreasing frequency as data from experimental and pathologic laboratories accumulate to establish a sound foundation for clinical electrocardiography

*I am indebted to my colleague, Dr. T. W. Parkin, for supplying the electrocardiograms in this case.

and as clinicians become increasingly proficient in application of that knowledge. The chance of error consequent to the occurrence of a rare exception to a usually valid correlation remains to plague us.

cardiographic correlation was upheld, with that in the case represented by the tracings in figure 4b.* These records also were obtained from a young man, but he was free of symptoms of disease, cardiac or otherwise, and clinical exam-

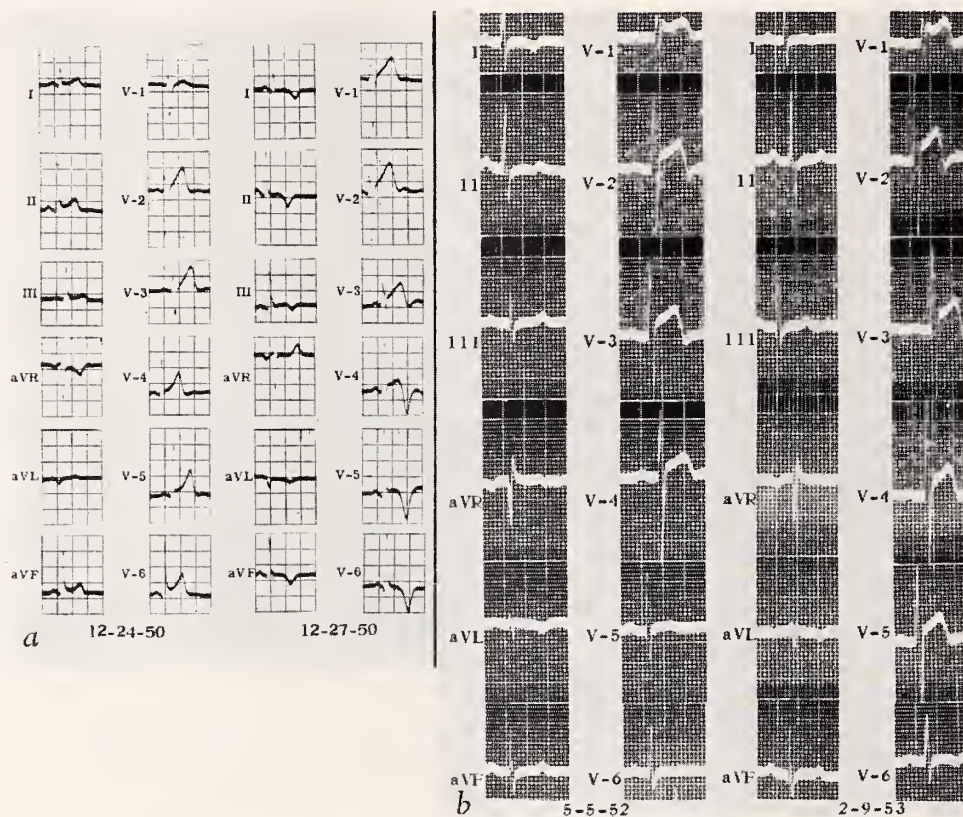


Fig. 4. *a*. Tracings disclosing segmental and T-wave changes typical of acute pericarditis. *b*. Tracings from a patient without cardiac disease in which pronounced segmental elevation persisted unchanged in leads V-1, V-2, V-3 and V-4 for 9 months. See text for discussion.

Three pairs of electrocardiograms are reproduced in Figures 4, 5 and 6. In each instance, the tracings from one patient resemble closely those from the other patient in each pair, yet the myocardial lesions producing these similar electrocardiographic abnormalities were remarkably different in the individual members of each pair.

The tracings in Figure 4a were recorded from a twenty-seven-year-old man who had symptoms and findings characteristic of acute nonspecific pericarditis. The electrocardiogram dated December 24, 1950, showed segmental deviations typical of the acute phase of pericarditis. In the tracings dated three days later, sharply inverted T waves appeared in leads I, II, III, V-4, V-5 and V-6. This evolution of changes is usual in acute pericarditis, although the degree of inversion of the T waves is uncommonly great. Contrast this situation, in which a well-established clinicoelectro-

cardiographic correlation was upheld, with that in the case represented by the tracings in figure 4b.* These records also were obtained from a young man, but he was free of symptoms of disease, cardiac or otherwise, and clinical exam-

Figure 5 presents a second pair of cases with similar electrocardiographic findings. The tracings

*I am indebted to Dr. Monti Belot, 800 Massachusetts St., Lawrence, Kansas, for supplying me with the clinical data and electrocardiograms in this case.

in Figure 5a were recorded from a sixty-year-old man who had experienced symptoms typical of myocardial infarction two years prior to the date of the first set of electrocardiograms. The complexes in this set are of interest in that they

This fifty-six-year-old man had experienced pain in the lower anterior portion of the left side of the thorax and in the left upper quadrant of the abdomen two days after bilateral herniorrhaphy. The onset of this pain was attended by

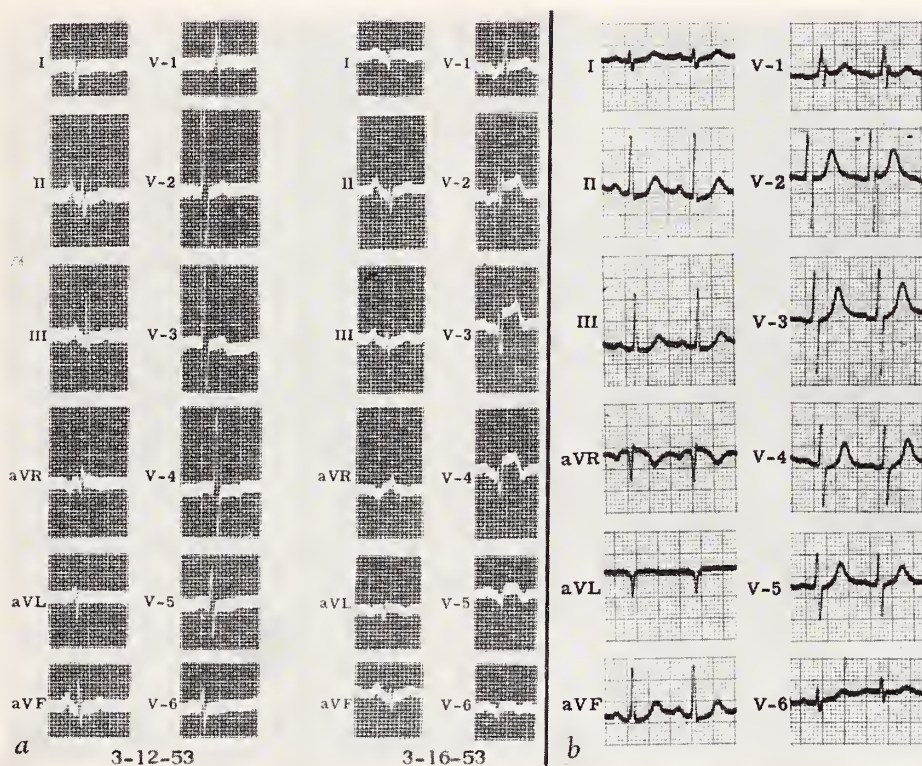


Fig. 5. *a*. The changes in the tracing of 3-12-53 were ascribed to the effects of an old transmural infarct of the posterolateral wall of the left ventricle. In the electrocardiogram of 3-16-53, changes have appeared related to an acute anteroapical infarct. *b*. Deformities of the ventricular complexes in this record were a consequence of partial right bundle-branch block.

suggest the presence of right ventricular hypertrophy. However, at necropsy after a second episode of myocardial infarction on March 16, 1953, an old transmural infarct of the posterolateral wall was found, together with an acute anteroapical infarct. That infarction of the lateral or posterolateral wall may be attended by the development of increased height of the R waves in leads from the right side of the precordium is an accepted fact. Such may have been the case in this instance, although a record made prior to the first infarct was not available to permit absolute judgment on this point. That an electrocardiogram of this form should not be regarded as affording conclusive evidence of infarction of the lateral wall in a patient whose clinical findings are of confusing character but raise justifiable suspicion of myocardial infarction is illustrated by the patient from whom the tracings in Figure 5b were recorded.

circulatory collapse that responded promptly to treatment. The patient's progress during the following week was satisfactory. However, on the ninth postoperative day, he had recurrence of pain and shock, and he died thirty hours later. Necropsy disclosed a postnecrotic ruptured aneurysm of the pancreatic artery, with intra-abdominal hemorrhage. No evidence of myocardial infarction, old or recent, or of pulmonary embolism was found. The peculiarities of the electrocardiogram presumably were related to partial right bundle-branch block.

The third set of confusing similarities is represented by the records in Figure 6. The tracings in Figure 6a contain the internal inconsistency of right axis deviation in the standard limb leads associated with evidence of left ventricular hypertrophy in the precordial electrocardiogram, an inconsistency dispelled by application of the concept

of the electrocardiographic disposition of the heart. One of my colleagues, Dr. H. B. Burchell, had predicted that rigid application of this concept might lead some day to discounting of changes related to myocardial infarction by ascribing them

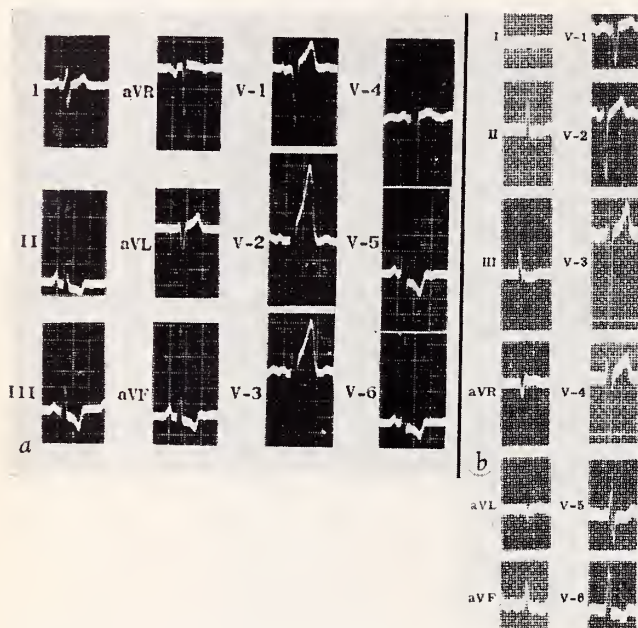


Fig. 6. *a*. A tracing illustrating the effect of left ventricular hypertrophy with electrocardiographically vertical disposition of the heart. *b*. A tracing resembling that in *a*. The QRS changes in this case resulted from transmural infarction of the lateral wall of the left ventricle.

to an electrocardiographically vertical disposition of the heart. Although the error was avoided in this instance by reliance on other substantial clinical evidences of old myocardial infarction, such misinterpretation would have been understandable on the basis of isolated electrocardiographic evidence in the patient from whom the tracings in figure 6*b* were obtained. This sixty-three-year-old man was admitted to the hospital because of severe pulmonary edema. Treatment was of no avail and he died within a few hours. Necropsy disclosed a transmural infarct of the lateral wall of the left ventricle. Loss of myocardial mass, rather than an electrocardiographically vertical disposition of the heart, almost certainly contributed to the production of a QS deflection in lead aVL and the slight right axis deviation in the standard limb leads.

Illustrations of the pitfall of undiscerning generalization could be multiplied many times. Attraction to this pitfall is derived from the well-recognized temptation to overextend the interpretation of laboratory data in relation to clinical problems. Avoidance of error can be promoted if

the electrocardiographic interpretation is made in the light of other pertinent clinical facts. Segmental elevation, even though of unusual degree, will not be ascribed improperly to myocardial injury if the clinician is aware that the tracing was made

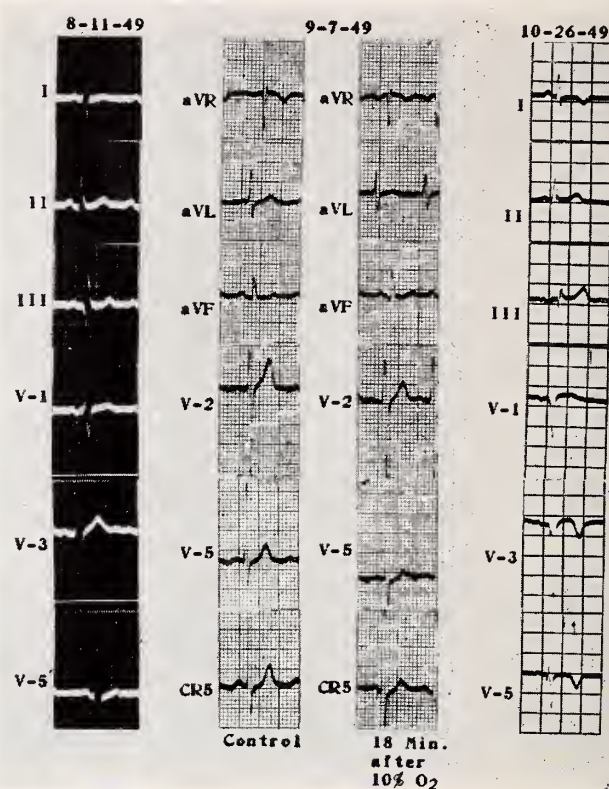


Fig. 7. The electrocardiograms on 8-11-49 and 9-7-49 were essentially normal despite clinical evidence of rather severe coronary insufficiency. Electrocardiographic evidence of myocardial infarction finally appeared in the tracing dated 10-26-49. See text for details.

on a young student in excellent state of health. A tall R wave in V-1 will be ascribed appropriately to right ventricular hypertrophy or, as the case may be, to infarction of the lateral wall of the left ventricle if consideration is given to other clinical data pertinent to rendering a discriminating decision. Likewise, careful appraisal of significant clinical findings will render unlikely the rigid or overly enthusiastic application of such a helpful concept as is represented in the influence of electrocardiographic position on the forms of the ventricular complexes in standard limb leads.

The Blind Faith That Makes Small Mountains

The electrocardiogram was normal, but the patient died.

One of the most treacherous of electrocardiographic pitfalls is related to the absence of change

in tracings taken from certain patients suffering from severe coronary insufficiency. Illustrative of this circumstance are the records reproduced in Figure 7. They were obtained from a thirty-nine-year-old man who had been experiencing during a period of five weeks episodes of severe pain extending over the front of the thorax and into both sides of the neck. These attacks had occurred both day and night, and their incidence was unrelated to physical activity. They commonly lasted thirty minutes or more unless nitroglycerin was taken, whereupon relief occurred within a minute or so. In spite of atypical features, strong suspicion existed that this patient's pain was an expression of coronary insufficiency. The electrocardiogram dated August 11, 1949, was considered to be within the range of normal. The Q deflection in lead III was unattended by a Q wave in lead II. A hypoxia test was done on September 7, during which the patient breathed 10 per cent oxygen for eighteen minutes. During this time, pain did not develop and his electrocardiogram remained unchanged. Because of increasing frequency and severity of the attacks of pain, the patient was admitted to the hospital on September 15. He was given a single, intravenously administered injection of aminophylline, grains $7\frac{1}{2}$, dissolved in 250 ml. of a 10 per cent solution of glucose. No more episodes of pain occurred from this day on, and dismissal from the hospital was permitted ten days later. After a month, the patient returned to report having had only two brief episodes of pain during the interim. The electrocardiogram at this time (October 26, 1949) showed changes diagnostic of antero-septal myocardial infarction, with inversion of the T waves in leads I, V-3 and V-5, loss of the R wave in V-3 and a qr deflection in V-5. In retrospect, the conclusion appeared well supported that the patient had experienced myocardial infarction during the hours immediately preceding his admission to the hospital on September 15. Because an electrocardiogram was not recorded at

this time, definition of the acute changes was not secured.

Significant is the fact that, even though careful electrocardiographic studies, including a hypoxia test, were carried out at a time when this patient was having severe and frequently recurring attacks of angina pectoris at rest, abnormalities of the ventricular complex were not recorded. Moreover, the patient did not experience an attack of pain when he breathed an atmosphere containing only 10 per cent oxygen for eighteen minutes.

An electrocardiogram, regardless of whether it is recorded in routine fashion, however elaborate this may be, or under conditions imposing stress on the heart, does not constitute a test whose negative results permit exclusion from further consideration of a diagnosis of coronary arterial disease.

Final Text

*"Because strait is the gate,
and narrow is the way . . .
and few there be that find it."*

In recalling this familiar Biblical admonition as an introduction to a final type of pitfall in electrocardiographic interpretation, my intent is not to discourage those who might aspire to mastery of this diagnostic technique; rather, I would encourage to new efforts some who failed in earlier attempts by reminding them that few among the many who try can master even the knowledge of their own day and hour. Advances in understanding, like the work of the world, are accomplished by those who can accept in good grace the mistakes and failures that beset their best and well-intended efforts. Therefore, the most treacherous of all pitfalls in electrocardiographic interpretation is the faint-hearted abandonment of efforts to make any interpretation at all, leaving that function to the remote and isolated expert, who may lack the clinical data essential to sound diagnosis.

HEARING IN CHILDREN

Different standards of hearing acuity are needed for the evaluation of different age groups below the adult level, Helen Kennedy, Ph.D., of Pasadena, California, reports from a study of children aged six through fifteen. A significant difference was found between the six and eight-year-old groups, and to a somewhat lesser extent between the eight and the fifteen-year-olds. The

"drop" in hearing acuity was found to occur most frequently at the twelve-year level.

"This would seem to indicate that the upper elementary grades may be a period of particular concern with regard to potential loss of hearing," the investigator said.

—*The Laryngoscope* (August) 1957

Prostatectomy in a Patient with Tetralogy of Fallot

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SEVEN cases of tetralogy of Fallot are reported, in which the patient lived beyond the third decade of life.¹⁻⁷ One patient had a laparotomy for gallstone ileus after the age of fifty. He expired on the seventh postoperative day with a wound dehiscence.⁷

Because of recent progress in surgical treatment of congenital cardiac disease, it is likely that many more such individuals will live longer and some may subsequently develop prostatic obstruction. It is our purpose to discuss the clinical course and special precautions observed prior to, during, and following prostatectomy in an individual with tetralogy of Fallot who survived to the remarkable age of fifty-six years.

Case Report

The patient, a white male accountant, was first admitted to the Urology Service of the University of Minnesota Hospitals on December 14, 1954, at fifty-four years of age. Three years previously, an episode of chills, fever, and dysuria had been successfully treated with antibiotics. Two months prior to admission, he noticed the onset of hesitancy, diminished force and size of the urinary stream, dysuria, postmicturitional dribbling, low back pain, pyuria and gross total hematuria. His symptoms were relieved by catheterization but not by antibiotics. He had noted mild exertional dyspnea all of his life. At the age of nineteen years he had an appendectomy and tonsillectomy without complications. Twenty-two years ago, he had been treated as an outpatient at the University of Minnesota Hospitals for acute dacryocystitis. At that time cyanosis and clubbing of the fingers and toes, a palpable thrill over the left second interspace lateral to the sternum, and a harsh systolic murmur, loudest in the pulmonic valve area but transmitted over the entire precordium, were noted. His blood pressure was 94/72; electrocardiogram was read as "arborization block and right ventricular preponderance." The hemoglobin was 105 per cent. He did well until the onset of his present illness.

The present admission examination revealed a short asthenic white man in no apparent distress; he weighed 132 pounds. The blood pressure was 110/80, the pulse

72. There was a peculiar inner ring of red pigment in both irises. The clinical examination of the lungs was normal. The heart was not enlarged; a thrill was palpated in the fourth left interspace close to the sternal border. The aortic second sound was slightly louder than the second pulmonic sound. A Grade IV systolic murmur heard over the precordium, loudest at the sternal border in the fourth left interspace. No abnormal abdominal organs nor masses were palpated; there was a right lower quadrant scar and no costo-vertebral angle tenderness. The fingers and toes were moderately clubbed and cyanotic. Neurologic examination was normal. The prostate gland was one plus enlarged, benign, and its profuse secretions contained numerous white blood cells. The residual urines varied from 85 to 180 milliliters.

Laboratory Studies.—Urine analysis: specific gravity, 1.020; pH, 6; sugar, negative; albumin, trace; sediment, 3+ wbc. The hemoglobin was 18.6 grams per cent, the white blood count was 5,150 with a differential count of 55 per cent neutrophils, 40 per cent lymphocytes, 1 per cent monocytes, 3 per cent eosinophils, and 1 per cent basophils. The blood urea nitrogen was 16 milligrams per cent. The urine culture contained *Bacillus proteus*. Cardiac fluoroscopy and pulmonary roentgenograms revealed a normal heart shadow and a normal pulmonary vascular pattern. The electrocardiogram disclosed a right bundle branch block. The excretory urogram was normal.

On July 13, 1954, following administration of 2,000,000 units of depot penicillin, a cardiac catheterization was done. The following data were obtained:

Sample	Pressure	O ₂	O ₂	
		Content	Capacities	
Right pulmon-ary artery	10.3/3.3	16.65	22.26	74.80
Left pulmon-ary artery	10.7/3.6	16.43	22.26	73.81
Pulmonary artery mean	6.0			
Right ventri-ple low	83.6/2.7	15.02		67.48
Right ventri-ple mean	23.4			
Right auricle mean	4.4	12.92		
Femoral artery		19.61		86.75
Superior vena cava		13.41		60.24

From Department of Surgery, Division of Urology, University of Minnesota Hospitals, Minneapolis, Minnesota.

Oxygen consumption plus 12.	188.91.	Basal metabolic rate	
		188.91	
Estimated systemic flow	10 (19.61—13.41)	=	
		3 liters / min.	
Estimated pulmonic flow	10 (19.61—16.53)	=	
		6.1 liters / min.	
Estimated shunt left to right	3.1 liters / min.		

Summary of Cardiac Catheterization.—Anatomic tetrad with evidence of both right to left and left to right shunts, being predominantly left to right shunt at rest. Actual shunts cannot be calculated because of mixing and simultaneous shunt in both directions. The ventricular sample was taken at ventricular apex and therefore is not representative of blood in the outflow tract.

Clinical Course.—Cystourethrogram revealed a Grade I enlargement of the prostate gland and an atonic bladder; subsequent cystoscopy utilizing intraurethral cocaine anesthesia confirmed this diagnosis. Prostatic massages and antibiotic therapy with tetracyclines afforded slight temporary relief of his symptoms.

On February 8, 1955, a trocar cystostomy was done. He received 500 mg. of tetracycline the evening before and again on the morning of the procedure, and 250 mg. of tetracycline four times a day for the next two weeks. Despite four months of cystostomy drainage and a course of prostatic massage, when the cystostomy tube was clamped, the residual urine varied between 120 to 240 milliliters. It was felt that a prostatectomy was indicated. For two days preoperatively, he received penicillin 500,000 units every six hours and tetracycline 500 mg. twice a day.

On February 22, 1955, under spinal anesthesia, eleven and one half grams of prostatic tissue were excised transurethally with a blood loss of 136 milliliters. The pathologist reported benign prostatic hypertrophy. Postoperatively his temperature remained normal except for a rise to 100.4 degrees a few hours after the operation. Penicillin 500,000 units four times a day and tetracycline 250 milligrams four times a day were continued postoperatively. On the third postoperative day, the urethral catheter was removed and the cystostomy tube was clamped. The residual urine which at first was low, progressively increased despite the use of cholinergic

drugs. On June 17, 1955, four grams of prostatic tissue and a wedge of the trigone were excised transurethally with a blood loss of 72 milliliters. On the first postoperative day, his temperature was 100.6 but subsequently remained normal. The urethral catheter was removed on the third postoperative day and the suprapubic tube clamped the following day. He voided satisfactorily with residual urines of 0 to 15 cubic centimeters. The postoperative blood and urine cultures were sterile, but he was receiving antibiotics. His hospital convalescence was essentially uneventful except for a slight hemorrhage on the twelfth postoperative day. The cystostomy tube was removed on July 12. The vesical neck has been periodically dilated in the outpatient clinic. As a precautionary measure he receives 500 milligrams of tetracycline the night before and the morning of dilation. He has gained weight and has continued to work up to the present time.

Summary

A fifty-six-year-old white man with a diagnosis of tetralogy of Fallot made by clinical examination and cardiac catheterization has had three operations for prostatic obstruction. This is the first reported case of a patient with tetralogy surviving a surgical procedure in the sixth decade of life.

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AGE AND ABSENTEEISM

An analysis of absenteeism among 619 workers in a Greater Boston food processing plant showed that both frequency and disability rates decreased with age, according to a study by the Gerontology and Chronic Disease Unit, Department of Public Health Practice, Harvard School of Public Health.

"The statistical record clearly supports a positive find-

ing that the absence experience of workers forty-five and over does not compare unfavorably with that of workers under forty-five," the investigators concluded.—H. R. Kahne, C. M. Ryder, L. S. Snegireff, and G. Wyshak: Age and absenteeism, *A.M.A. Archives of Industrial Health*, 15:134 (Feb.) 1957.

Preoperative Roentgen Diagnosis of Abdominal Tumors in Children

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IT IS still the policy of many physicians to adopt an attitude of surrender when faced with the preoperative diagnosis of abdominal masses in infants and children. Many of these physicians still believe that it is wasteful to lose time and spend the patient's family's money on roentgen studies and would rather leave the task of diagnosis to the surgeon and pathologist.

Such reasoning is fraught with rather obvious dangers and pitfalls. Physical diagnosis and history alone usually can only establish the presence of a space-occupying lesion. If left to such methods alone, one can only conclude that the mass is in the abdomen. Its extent, its location, and its nature cannot be made out. A correct preoperative diagnosis has many advantages. If it is concluded that a lesion is within the kidney, the case may be handled better by a urologist than a general surgeon. A retroperitoneal mass will require a different surgical approach than an intraperitoneal tumor. Some masses should have biopsies done only to confirm the roentgen diagnosis, and then irradiated rather than surgically removed. If correctly localized and diagnosed, some space-occupying lesions will be best treated if no operation is undertaken. It has been our experience occasionally that a correct preoperative diagnosis will not only guide the surgeon in his search for the tumor, but will also give him the necessary stimulus and assurance to persist at time of operation in the search for an elusive lesion in a region of difficult access. It is rather paradoxical that there should be such general emphasis on accuracy in diagnosis while an approach of defeatism is adopted in such a wide field; that there should even exist an argument whether one should attempt to exactly localize and identify a mass in a child's abdomen.

It is the purpose of this writing to present a roentgen method which is based on simple, rather

routine procedures commonly done in all hospitals and even offices. By using this roentgen approach and evaluating the findings in the light of history, physical findings, and the patient's age, sex, and laboratory information, a correct preoperative diagnosis based on statistical probability can be made in a high percentage of cases.

A systematic approach to the roentgen diagnosis of abdominal masses in general lagged somewhat behind the progress in other fields. While the opacification of the gastrointestinal tract followed the discovery of x-rays only by a relatively short time, it was not until 1923 that a method for discovery of masses by their displacement of the opacified gastrointestinal structures was described.¹ Brown emphasized the importance of the lateral view in 1928.² Rigler in 1933³ devised a classification based on location, using routine gastrointestinal contrast studies as well as pycelography. He also emphasized the use of lateral views. Rose⁴ and later McCullough and Sutherland⁵ wrote on intra-abdominal calcification and its significance. An extensive elaborate monograph exists in Spanish⁶ dealing with the topographic study in the diagnosis of abdominal tumors in adults. Nice et al.,⁷ produced a monograph dealing more fully with the method described in this presentation.

We believe that the first step in the roentgen diagnosis of an intra-abdominal mass should be its exact location. Is the mass within the peritoneal cavity or is it extraperitoneal? Is it located within an organ or is it in the supporting tissues? In order to answer these questions, advantage is taken of several easily identifiable landmarks.

In the course of the development of the intestinal mesentery and the gastrointestinal tube, the dorsal mesentery of the duodenum and the mesentery of the ascending and descending colon become attached to the posterior abdominal wall and become obliterated. As a result of this, the second portion of the duodenum as well as in most instances its third portion, the descending colon, the ascending colon and the rectum have no mesentery. The upper rectum as well as the other

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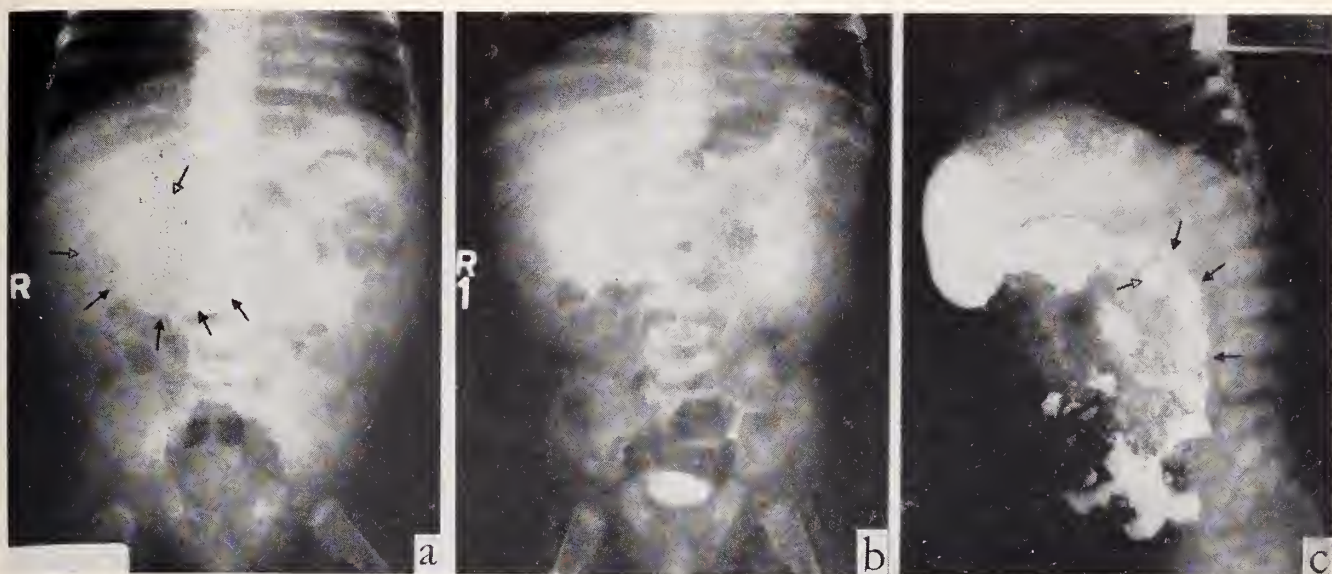


Fig. 1. Primary hepatoma in a five-month-old male infant. (a) A soft tissue mass inseparable from the liver (black arrows) but clearly defined from the right kidney (white arrows) is seen in the right upper abdomen. (b) The right kidney is depressed slightly but normal. (c) The mass displaces the stomach anteriorly. The second portion of the duodenum (black arrows) and the duodenojejunal junction (white arrow) are in normal position indicating that the mass is intraperitoneal.

structures described are covered in front and on the sides by the parietal peritoneum and lie against the posterior abdominal wall. The pancreas, too, assumes a retroperitoneal position as does the distal part of the common duct. Usually a duodenojejunal junction can be identified easily, especially on contrast studies, and is attached to the posterior abdominal wall by means of the ligament of Treitz, a fixed structure. The bladder has a peritoneal covering over its dome, but is an extraperitoneal structure. The kidneys and ureters, also structures readily recognized, are retroperitoneal. The liver, spleen, and stomach are enveloped by the visceral peritoneum, except for minor areas of their surface. The small bowel except for the duodenum, and the transverse colon and sigmoid, are suspended on their mesentery along which the parietal peritoneum reflects to cover the mesentery and the bowel wall, thus forming the visceral peritoneum. Occasionally, variations of this typical arrangement occur, but these are easily understood as phases of arrest in the rotation of the bowel and obliteration of the mesentery, and, once identified, can also be used in localization.

Using the structures described, and their rather fixed location, a series of landmarks is established. By outlining the duodenum and the duodenojejunal junction with barium and studying them in frontal and lateral projections, it can be readily recognized that a retroperitoneal mass in the region of the head of the pancreas, or behind it,

will widen the duodenal loop in frontal projection and displace the second portion of the duodenum forward in the lateral projection. The duodenojejunal junction will be unaffected. A cystic dilatation of the common duct, a choledochal cyst, if small, will cause an impression on the second portion of the duodenum, and, if large, will also displace it forward in lateral view without widening the duodenal loop in frontal projection. It usually will displace it medially. Similarly, a right upper quadrant intraperitoneal mass, such as hepatoma of the right lobe of the liver⁸, while located in the same general area in frontal projection, will displace the landmarks that are fixed immediately behind the parietal peritoneum posteriorly.

A retroperitoneal mass in the central upper abdomen, such as a cyst of the pancreas or a tumor of sympathetic nervous origin, will displace the duodenojejunal junction forward, and usually downward, while separating the stomach from the transverse colon. The stomach will be pushed forward in the lateral view. Intraperitoneal masses in this region, a hepatoma of the left lobe of the liver, for instance, will displace the stomach to the left, and forward or posteriorly, but the duodenojejunal junction will not be displaced anteriorly. The ascending or descending colon will also be displaced forward by a retroperitoneal mass that arises laterally while they will be impressed on their anterior surface by intraperitoneal masses. One should remember, however, that, if there is

partial malrotation of the colon with preservation of a mesentery of the ascending colon, this structure may be displaced forward by an intra-

Lateral displacements near the kidney are a sign of extraperitoneal location of the lesion. Anterior displacement of the ureters, as seen in lateral

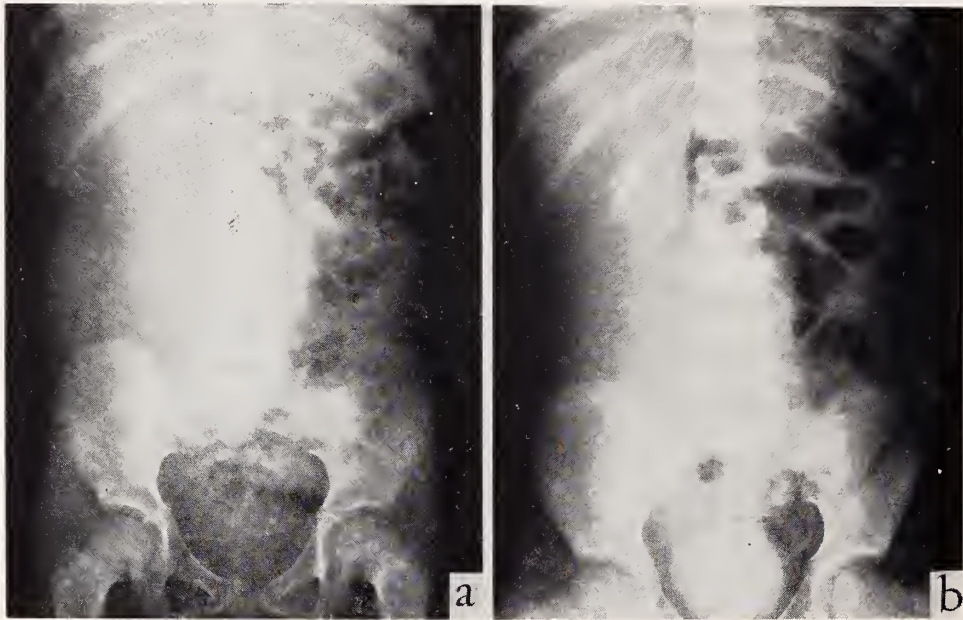


Fig. 2. Wilms' tumor of the right kidney in a six-year-old girl. (a) A large soft tissue mass is present in the right abdomen displacing the small bowel including the duodenum. It is inseparable from the right kidney. (b) Excretory pyelogram. There is distortion of the calyces and the right renal pelvis. The uretero-pelvic junction and the entire upper ureter are displaced medially.

peritoneal mass, as, for instance, a mesenteric cyst.

The rectosigmoid junction has a constant position near the sacrum. It is from there that the mesosigmoid arises, and the sigmoid itself has a variable course according to its length. In lateral projection, an intraperitoneal lesion will be seen either not to affect the junction at all, or it may impress it downward and on its anterior surface, or occasionally even displace it posteriorly, according to its size. A retroperitoneal tumor will displace the rectosigmoid junction anteriorly, away from the sacrum.

The transverse colon is suspended on its mesentery and, therefore, is quite movable. Intraperitoneal masses may displace it anteriorly or posteriorly according to their location. We have encountered a case of hepatoma in which the transverse colon could be seen wrapped around the tumor. An omental cyst will usually be seen to displace the transverse colon posteriorly, a mesenteric cyst anteriorly.

The ureters can be displaced laterally, as seen in frontal projection, by either an intraperitoneal or extraperitoneal mass, depending on its size. This is especially true in their lower two-thirds.

projection, is usually due to a retroperitoneal lesion. Conversely, a posterior displacement usually is caused by an intraperitoneal mass.

A neuroblastoma or other adrenal mass will displace the kidney downward and quite frequently laterally. Anterior displacement also is not rare. Posterior displacement of the kidneys, often combined with downward displacement and compression, is commonly caused by tumors of intraperitoneal location such as mesenteric cysts or hepatomas. This is not an absolute sign, however, as choledochal cysts which are retroperitoneal can produce the displacement.

The ureteropelvic junction is an important landmark; when displaced medially in frontal projection, it usually signifies that the mass is within the kidney. Large masses almost anywhere within the kidney will produce this appearance, with the exception of a lesion that is limited to the medial aspect of the upper pole. A central retroperitoneal mass will displace the kidney to the side and will move the ureteropelvic junction laterally.

The bladder has to be outlined by opaque medium before one can make positive statements as to a displacement upward from the pelvic floor. In cases following trauma and pelvic fracture,

this displacement is most frequently due to a hematoma. Without such history, in the male the cause is usually a tumor of the prostate, and

peritoneal location in a child with known neuroblastoma is usually an indication of metastatic spread. Certain types of calcification and the

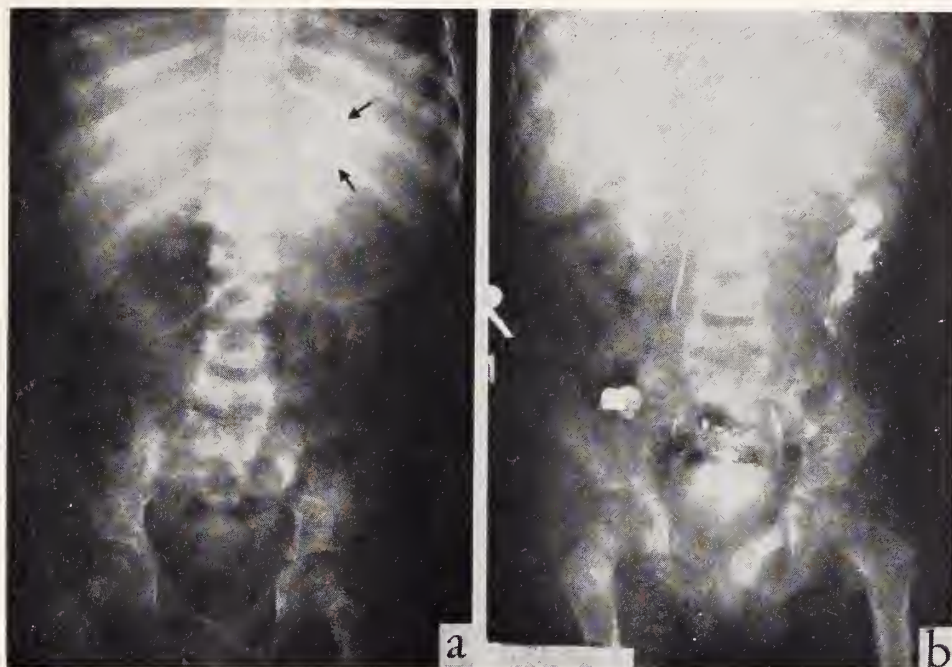


Fig. 3. Neuroblastoma with multiple bony metastases in a four-year-old boy. (a) There is extensive calcification in the region of a suprarenal mass on the left. (b) Excretory pyelogram. The left kidney is depressed and displaced laterally. The ureteropelvic junction is displaced laterally.

sarcomas of the prostate are more common in childhood. Ovarian or dermoid cysts will usually cause an impression on the bladder dome.

While displacements of landmarks will be of great importance in determining the location of the tumor, of equal importance is the attempt to outline the limits of the mass and establish whether it is single or multiple. One should also use frontal as well as lateral and, if necessary, oblique projections to determine whether the mass lies within the limits of an organ, such as the liver, spleen, or kidney. The outline whether regular, round, or undulating, indicating nodularity, often distinguishes between a cystic structure and a solid malignant tumor.

Calcification and its pattern is frequently of great importance. Often calcification will indicate the presence of a mass that otherwise would be obscure. We have had cases of adrenal cortical tumors and small neuroblastomas in which the presence of calcification was the only localizing sign. A stippled irregular area of calcification in a growing mass in the liver is usually seen in hepatoma. New areas of calcification in retro-

appearance of formed structures are seen only in teratoid masses. They may be intraperitoneal, if of ovarian origin, as many dermoid cysts are, or retroperitoneal. Some of the retroperitoneal teratomas may be highly differentiated and even present the appearance of fetus *in situ*. Calcifications within cysts can also be demonstrated to move around with change in position. Advantage can also be taken of the layering property of the fatty content of a dermoid cyst, if the film is taken in upright position.

In examining a mass, information can be gathered also from areas distant from the tumor. Advanced maturation as determined by early appearance of epiphyses can be a sign of an adrenal cortical tumor. The greater and lesser trochanters can be helpful as they are frequently included in films of the abdomen. Similarly, evidence of mediastinal and hilar adenopathy or presence of bone destruction may give valuable identifying information.

The method described is based on the use of plain films of the abdomen with frontal and lateral projections believed to be essential. The

upright position is frequently valuable. The upper and lower gastrointestinal examination with barium with the use of lateral projections is neces-

statistical probability, taking the patient's age and sex into account, one's diligence will usually be rewarded.

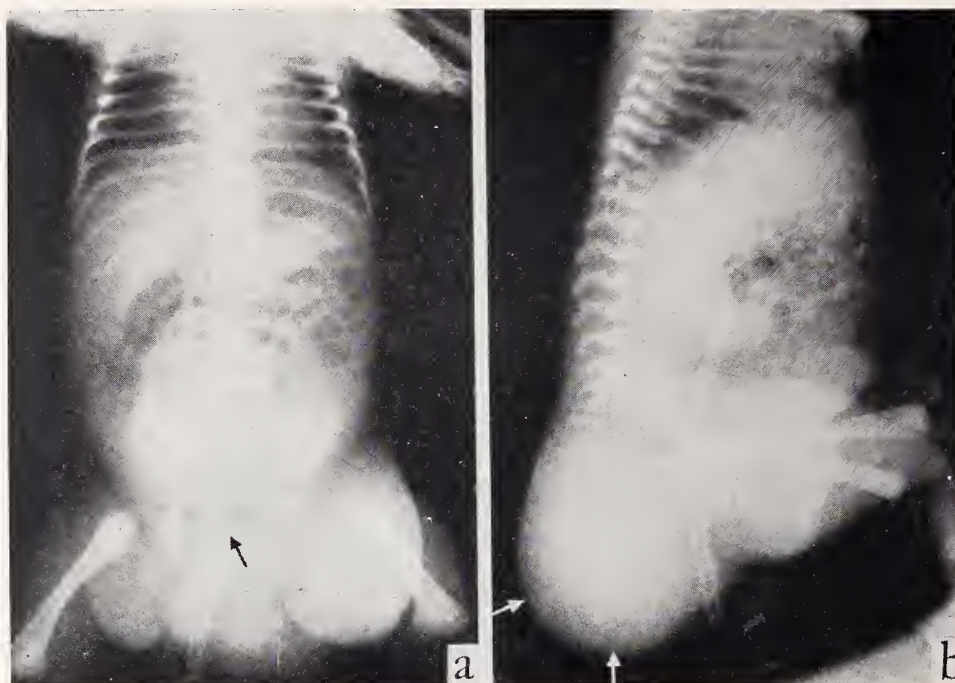


Fig. 4. A teratoma with neuroblastoma in a two-day-old female infant. (a) A large soft tissue mass displaces the rectum to the right and the small bowel out of the pelvis. The arrow points toward a bony density in the mass, a tooth identifying the tumor as a teratoma. (b) The rectum (with the tube) is displaced forward indicating that the mass which extends below the coccyx has a retroperitoneal extension. The whole intestine is pushed forward. Arrows point toward calcifications in the mass.

sary for precise identification of many of the landmarks discussed. Urography, excretory and, if necessary, retrograde, should be obtained for localizing purposes also in masses that are outside the urinary tract. Cholangiography and cholecystography are rarely needed, but in certain isolated cases may be of value. It is unfortunate that these procedures do not give visualization of structures when most needed, as in the cases of choledochal cysts.

It is interesting to note that these rather commonplace studies are usually all that is needed in the radiographic work-up. The use of more elaborate procedures, such as planigraphy and presacral gas injection, are refinements that are unnecessary in the great majority of instances. If all the information from the roentgenograms as to location, size, outline, content, is correlated with data from the history, physical examination and other laboratory examinations, and all of these facts are evaluated in the light of available

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The Patient's Use of Gestures in the Diagnosis of Coronary Insufficiency Disease

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PAIN in the chest is one of the most frequent complaints the doctor hears. The difficulty in determining the cause of this pain is attested to by the number of articles on the subject, and by the great number of consultations requested on this diagnostic problem. The difficulty is further emphasized by the recent description of the carotid sinus pressure maneuver which may promptly relieve the pain of acute coronary insufficiency and permit its rapid identification. It is significant that a cardiologist of great experience would find this new test useful.¹

The diagnosis of coronary disease is best understood by a division into three syndromes. Each has its distinctive symptomatology, pathologic connotations and therapeutic program.

The easiest to understand, since pathologic material illustrating it is so plentiful, is acute myocardial infarction usually occasioned by coronary thrombosis. Generally speaking, in this disease the pain is severe; it is associated with impressive systemic manifestations and sooner or later with diagnostic electrocardiographic changes in at least 80 per cent of cases.

The second form of coronary artery disease that concerns us is angina pectoris. Angina usually gives rise to a pain or discomfort that is transient, episodic and recurrent; usually, it is not associated with constitutional symptoms, and it is not accompanied by diagnostic electrocardiographic findings. If an abnormal electrocardiogram is found, it is not pertinent to the diagnosis of angina, but does counsel restraint in dismissing the pain as not coronary engendered.

Coronary insufficiency, or so-called "coronary failure," or "the intermediate coronary syndrome," is a diagnostic term describing a condition myocardial in origin, in which the pains are longer in duration and more severe than in angina. In this condition, clinical, hematological, enzymatic, and electrocardiographic criteria of myocardial infarction do not develop. Its pathological physiology is usually stated to be an ischemia or ne-

crosis of the myocardium and, in particular, of the subendocardial muscle layers. Coronary insufficiency can be secondary to some other condition; for example, anemia due to a primary blood condition or to hemorrhage, most often from the gastro-intestinal tract. Coronary insufficiency is an important diagnosis because it may be a premonitory symptom of myocardial infarction.

These three syndromes are in most instances due to coronary atherosclerosis. Valvular heart disease, aortic stenosis or regurgitation, and luetic aortitis often first announce themselves with chest pain, but are numerically much less important causes.

While the nomenclature may be confusing, it is simpler to call the pain originating from each of these three conditions "coronary insufficiency pain" and include under it myocardial infarction, angina pectoris, and, what is generally termed in the literature, coronary insufficiency.

This classification is based on present concepts and is simple and workable. The simplicity vanishes when the physician encounters the patient who does not have classic symptoms or findings.

Prior to discovering what will be related herein, I leaned, as have others, on a verbal interpretation of the pain. As in other fields, the analysis of the pain, when present, is the keystone of the diagnostic arch. The patient relates his story, suitable questions are asked, and specific points are checked. In angina, the physical examination and the laboratory tests are not helpful. The same paucity of physical and laboratory findings may exist in the first two to twenty-four hours of myocardial infarction. This is an important point not frequently emphasized. The history in this early period may be of crucial importance.

There are other problems in the diagnosis of chest pain in the ambulatory patient. The patient with chest pain is often unable to be as helpful as we wish. He may be a poor observer or he may not be capable of explicit answers. He may

have two kinds of chest pains coexistent which he has never separated in his own mind. Other shortcomings of the verbal method of examination are language difficulties and verbosity. Cer-

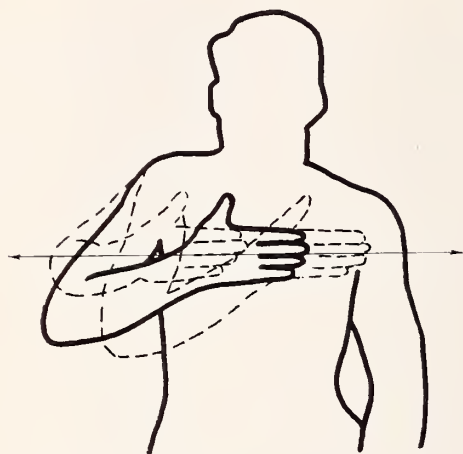


Fig. 1. This illustrates gestures Number 1 and Number 2. Number 1 involves the transverse sweep of the flat of the hand across the upper chest. Number 2 is the static placement of the hand over the sternum.

tainly, it is true that sensations of the body often outstrip vocabularies. The practitioner, mindful of the number of conditions that cause chest pain and that mimic angina in part, may terminate the interview by ordering an electrocardiogram and the diagnosis becomes more clouded.

Awareness of Gestures

About two years ago, it appeared to me that patients suffering from "coronary insufficiency pain" frequently used their hands to indicate the location and severity of their discomfort. I developed the habit of taking a few minutes more with them after the diagnosis seemed secure and of having them re-enact their pain description. Certain similarities became apparent. In talking with patients having chest pain related to other conditions, it appeared that the gestures used by the cardiac patient were not frequently used by noncardiac patients. In certain instances, the gestures used by cardiac patients were so spontaneous and so identical to those seen in others that I began to feel they might have diagnostic significance or, at the very least, provide a clue to alert the observer and to induce him to pursue a certain line of questioning or investigation.

A review of the texts, monographs and current articles on the diagnosis of coronary artery dis-

ease showed slight regard for gestures used by patients to describe their sensations. There were two exceptions to this. White² stated that patients with angina often lay the flat of the hand on the



Fig. 2. This illustrates gestures Number 3 and Number 4. See text for details.

mid-sternum to indicate their pain. Levine³ mentioned the half-closed hand placed on the mid-sternum and moved by the patient upward to the throat, or bilaterally to the jaws, as a nearly diagnostic gesture of coronary disease pain.

It is my contention that there are certain mannerisms and gestures commonly used by those suffering from coronary insufficiency pain, used in the sense defined above, that, when seen, can alert the physician at once to the likelihood that a discomfort complained of is of serious import. I call this concept the "nonverbal diagnosis of coronary insufficiency pain."

To describe any gesture thoroughly one should include several features. For example: a gesture involves placing the hand or fingers in a certain position on the body, it includes the position of the hand in relationship to the fingers and, finally, any motion that the hand might describe.

In coronary insufficiency pain, six gestures or portions of gestures are used with sufficient frequency and similarity to constitute an aid to diagnosis.

Description of the Gestures

1. *The Flat Sweep* (Fig. 1).—The flat of the hand, usually with the fingers not widely separated, is placed on the mid-line of the body on the sternum at the level of the first intercostal space or down to the fourth rib line. The hand is then lightly swept across the chest from far left to far right, or vice versa, usually with an

quidistant swing bilaterally in a strictly horizontal plane. The fingers are not pressed into the chest, nor is the hand stopped at any point in the sweep.



Fig. 3. Gestures Number 5 and Number 6 commonly seen in ischemic heart disease are depicted.

2. *The Flat Placement (of White)* (Fig. 1).—

The flat of the hand is laid on the chest in the mid-portion of the body anywhere between the first intercostal space and the fourth rib line, but there is no movement of the hand when so placed. This is the gesture described by White.

3. *The Two-Handed Press* (Fig. 2).—

The pads of the fingers are laid at the midpoint of the chest on the sternum somewhere between the first intercostal space and the fourth rib line, and then separated in a horizontally sweeping motion, completely or partially across the front of the chest again in an equidistant manner bilaterally, both hands being used.

4. *The Two-Handed Squeeze* (Fig. 2).—

A variant of the third gesture is the placing of the hands at about the anterior axillary line bilaterally and moving medially so that they meet in the midline, again the hands moving in a horizontal plane.

5. *The Reverse Necktie* (Fig. 3).—

The fingers of one hand or the other are flexed in a semi-clutched position, a sort of half-fist appearance, and the hand is then placed on the midsternum, again, anywhere from the first intercostal space level to the fourth rib level. This placement of the hand is then followed by a gesture often accompanied by a tighter squeezing of the fingers to a full fist appearance and by a vertical motion

TABLE I. GESTURES USED BY PATIENTS WITH CORONARY DISEASE

	No. Cases	Gestures Used						Total Gestures	Per Cent
		1	2	3	4	5	6		
Myocardial Infarct	14	7		2		3		12	83
Coronary Insufficiency	28	4	3	2	2	4	2	17	61
Angina	40	4	9	2		3	2	22	55

Note: Table I summarizes the frequency of the gestures used in different types of ischemic heart disease.

up towards the throat or to the lower jaw. At other times, the hand opens as it ascends to include both sides of the throat or both lower jaws.

6. *The Midline Clutch* (Fig. 3).—This is the same as above without the addition of the motion of the hand. It refers to the placement of the hand in a semi-clutched position, in the midline in the areas described.

Cases Observed

The group of cases that I have considered in respect to the gestures are summarized in Table I.

The series on myocardial infarction is small, perhaps because the diagnosis is usually quite evident on other grounds, and the details about the pain description were not recorded. At any rate, of the fourteen cases, seven of them used gesture Number 1 and twelve of the fourteen 83 per cent, used one or the other of the gestures which have been described. In coronary insufficiency I feel that the gestures are often seen in their most typical form, in particular, those which have been occasioned by hemorrhage. The group includes twenty-eight patients, seventeen of whom used one or the other of the gestures. Forty patients diagnosed as having angina have been interviewed with the idea in mind of identifying the location of the pain and gestures used. Approximately one half (55 per cent) have used the gestures in the forms described. All of these patients were seen by me personally.

Initially, patients with angina would frequently refuse to indicate by a gesture where their pain was. However, when asked specifically to indicate the pain, they all did, in some way, attempt a gesture. I think that when the patient does attempt a gesture after prompting in this way, the diagnostic significance is less than when he uses a gesture which is a spontaneous concomitant of the sense of his idea. In myocardial infarction, spontaneous typical gestures are often used by

the patient in preference to talking about his pain. In angina, on the contrary, the patient must often be asked pointedly to demonstrate his pain. It is as though the anguish of severe pain causes people to revert to the more primitive method of communication by gestures. Indeed, not uncommonly in infarction, the severity of the pain may be gauged by the repetition of certain of the gestures. One fatal case repeated gesture Number 1 six times before speaking a dozen words about his condition.

I wish to emphasize that the absence of a typical gesture by no means establishes that the patient does not have coronary disease. Obviously, other features of the history are of importance and, in infarction, electrocardiographic and other laboratory aids are of benefit. However, these gestures are used with considerable frequency, perhaps 50 per cent of the time, by persons who are suffering from one of these three conditions. If the gestures are seen in their pure form and spontaneously used by the patient, I think they are a diagnostic clue of considerable importance.

As I became more interested in this I related my feeling about it to some other physicians and three interesting stories were later told to me. One physician was called to the home to see an older lady because of chest pain. The lady minimized the discomfort and thought her relatives were unduly apprehensive. My physician friend examined her and found nothing striking on the physical examination. There was no change in a previously known moderate hypertension, no change in heart tones, no gallop rhythm, and no evidence of congestive failure. He was inclined to leave her, as she had been in bed, and not be particularly concerned about her episode of chest pain. However, he waited a moment longer and asked her, "where does it hurt?" She promptly performed, in its classic form, gesture Number 1. The physician then insisted on hospitalization and an electrocardiogram that evening showed an unmistakable myocardial infarction pattern.

Another instance I am not certain I wish to emphasize happened this way: I had described the gestures which I have portrayed to a practitioner acquaintance. He had a patient under his care who had been indicating his pain as epigastric in location and predominantly abdominal in type. However, this man was known to have heart disease, in particular, an old infarction. This new pain, while other criteria were

lacking, was felt by his physician to indicate an acute coronary disease process. Because the gesture which the patient was using was in marked contrast to the gestures which I had been describing for coronary artery pain, the physician was induced to investigate the matter further and discovered a peptic ulceration and penetration, for which suitable treatment produced relief of the man's persistent complaint.

A third instance of the use of the gestures has been related to me. A patient was brought to the emergency room of a local hospital with a history of having swallowed a fish bone, and with chief complaint of the fish bone lodged in the esophagus. He indicated his pain as in the midline, and in fact, used gesture Number 5. He was initially referred to an endoscopist with the intent of removing the foreign body. The endoscopist, however, aware of the gesture description from a recent discussion of them, was greatly impressed with the classic form of the gesture being used. As a result, an internist's consultation was obtained and electrocardiographic studies ordered with the eventual diagnosis of an acute myocardial infarction. The fish bone was felt to be an incidental occurrence and it actually passed spontaneously without instrumentation. In this instance, even the presence of a foreign body in the esophagus did not prevent the classic gesture from appearing and the alertness of the endoscopist to lead to the correct diagnosis.

False Positives

Of importance is the possible use of these gestures by people who do not have coronary disease.

In two instances, people with acute cholecystitis used gesture Number 3. In fact, they used the gesture in such a recognizable form that I was initially suspicious that they had coronary disease. However, eventual evaluation led me to feel their difficulties arose in the gall bladder. Of course, the question as to the origin of chest pain in cholecystic disease has been debated in the past. There is one interpretation that it is entirely a referred pain; the other theory is that the cholecystic disease sets up a coronary spasm which does induce coronary insufficiency pain. The close similarity of the gestures used in these two patients with cholecystitis would tend to favor the theory that actual coronary constriction was occurring and that these people did in actuality have cor-

nary insufficiency. They have not been included in that category in the table.

Whether or not people with other types of

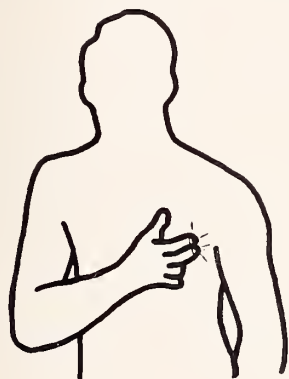


Fig. 4. This is a common gesture in non-cardiac pain, namely the costochondral syndrome.

chest pain will mimic these gestures I am not prepared to say with finality. It seems to me that they do not. The chest is not a particularly large area, and the hands, relatively speaking, are fairly large so that in a person who is given to a good deal of gesticulation certain positions might be momentarily assumed which are similar to those described. The significant gestures are more of a distinct movement on the part of the patient, frequently a repeated movement, not associated with other motions about the chest. Of course, the gestures are meaningful only when used to depict pain or discomfort.

In nervous people, particularly females who indicate their pain in various ways and who are accustomed to moving their hands about a good deal to indicate how they feel, I have some times seen portions of the described gestures. Another feature about these individuals in their use of gestures is the frequency of diagonal positions. They do not usually lay one hand or both hands across the chest transversely or sweep the hands in a strictly horizontal plane, as do patients with coronary disease.

Gestures in Non-Cardiac Chest Pain

There are other gestures used by people without cardiac disease, which are quite distinctive. A very frequent complaint is pain of the chest wall. Frequently this is in the intercostal areas and in the areas of the costochondral junctions. These people with chest wall pains, or the costochondral syndrome, will usually indicate the pain with the tips

of the fingers, generally held at a right angle to the chest, in the area of the left sternal border or laterally in the area of the costochondral junction.

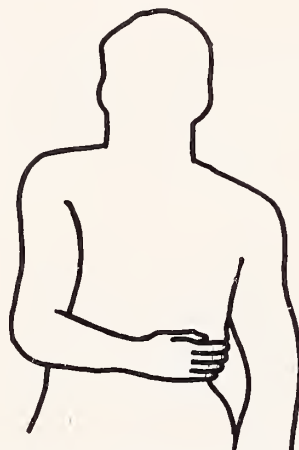


Fig. 5. The hand is often placed in this manner when the patient is describing the sensation of pain originating from the colon.

tions. They frequently dig the fingers into the chest in their attempts to portray the sensation, (Fig. 4), a rather distinct contrast to the type of gestures which have been described for coronary disease pain.

Another very frequent cause of pain in the chest appears to originate in the colon with radiation into the chest. When this is primarily in the left upper quadrant it is often referred to as the splenic flexure syndrome. People with this condition often indicate their pain far on the lateral margin of the chest near the costal margin and often radiating up toward the axilla or toward the middle of the chest. They often use the entire hand in a grasping motion or put the hand in the form of a cone and direct it upward from the colonic area (Fig. 5), in contrast to the gestures described earlier in this paper.

Individuals who have palpitation often indicate their discomfort in the left lower lateral chest area about the fifth, sixth, and seventh rib level extending from the midclavicular line to the mid-axillary line. They often use the entire palm in a grasping motion in this area, frequently at the same time saying, "This is where it hurts, right over my heart."

The observation of gestures in other types of chest pain is useful in the discussion with the patient and in explaining to him that something other than the heart is causing his pain. The

(Continued on Page 737)

The Establishment of a Blood Vessel Bank

Sterilization of Vascular Homografts Using Beta-Propriolactone

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CONSIDERABLE progress in vascular surgery has been made during the past decade, particularly in the treatment of aneurysms and segmental arterial occlusions. These newly developed procedures have often required blood vessel substitutes from vein autografts,¹ vascular prostheses² or arterial homografts. However, many community hospitals have not been able to maintain an adequate supply of the latter because of difficulties encountered in obtaining and preserving sterile homografts. Currently, techniques are available which should make it possible for hospitals to establish and maintain a blood vessel bank.³ It is the purpose of this paper to outline the methods used in the procurement, sterilization and preservation of blood vessels for arterial homografts using beta-propiolactone. In our experience, this method seems well suited for hospitals even in a smaller community.

Rationale of Technique

The drawbacks to obtaining homografts under sterile conditions are obvious. To overcome these handicaps, physical and chemical sterilizing procedures have been worked out which permit materials to be collected during a routine autopsy and then subsequently be sterilized and utilized as a vascular substitute. The use of beta-propiolactone*, a sterilizing agent, as developed for this purpose by a group of workers at the Henry Ford Hospital in Detroit,⁴⁻⁸ serves admirably in this regard. It is an internal ester of beta-hydroxy propionic acid and is extremely active due to the tendency of the ring to open.⁹ It is very toxic and caustic, acting as a sterilizing agent by combining with hydroxy, amino, carboxyl, sulfhydryl

and phenolic groups of protein molecules. Its potent bactericidal, virucidal, fungicidal and sporicidal effects have been well demonstrated.⁹ The products of hydrolysis, which must occur for the beta-propiolactone to exert this effect, result in compounds which have been shown to be non-toxic but of a low pH. The effect of this agent on the elasticity and tensile strength of the graft is not significant if the acidity of the sterilizing solution is kept near a pH of 7.4. In aqueous solutions the half-life of beta-propiolactone at 37° C. is thirty to forty-five minutes (Fig. 1). However, when stored in the pure concentrated form in a refrigerator at 4° C., it is stable for ten months.

Method

The graft to be sterilized should be obtained as soon after death as possible. An interval of less than six hours is considered quite safe, although if adequate refrigeration has been used, the vessels can be successfully transplanted up to twelve hours after death. Preferably, the donor material is obtained from a patient under the age of forty-five but the degree of vascular degeneration in each instance must be individually evaluated. Certainly, patients dying of atherosclerotic processes or collagen diseases should not be used. In obtaining the graft, excessive contamination should be avoided, particularly from gastrointestinal contents, and in this regard it is wisest to procure the blood vessels at the start of the post mortem. They are rinsed in saline, trimmed of fat and extraneous tissue, leaving the adventitia intact, and then sterilized as outlined below after a minimum of delay.

A long forceps and the empty pyrex jars to be used to sterilize, rinse and store the grafts are thoroughly cleaned and then sterilized by autoclaving. Satisfactory jars are those in which suture material comes (Fig. 2). Strict technique, in-

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cluding the wearing of a surgical mask and the use of only sterile solutions, such as that used in the operating room or bacteriologic laboratory, is necessary throughout.

Half-life of beta-propiolactone in water at different temperatures.⁹

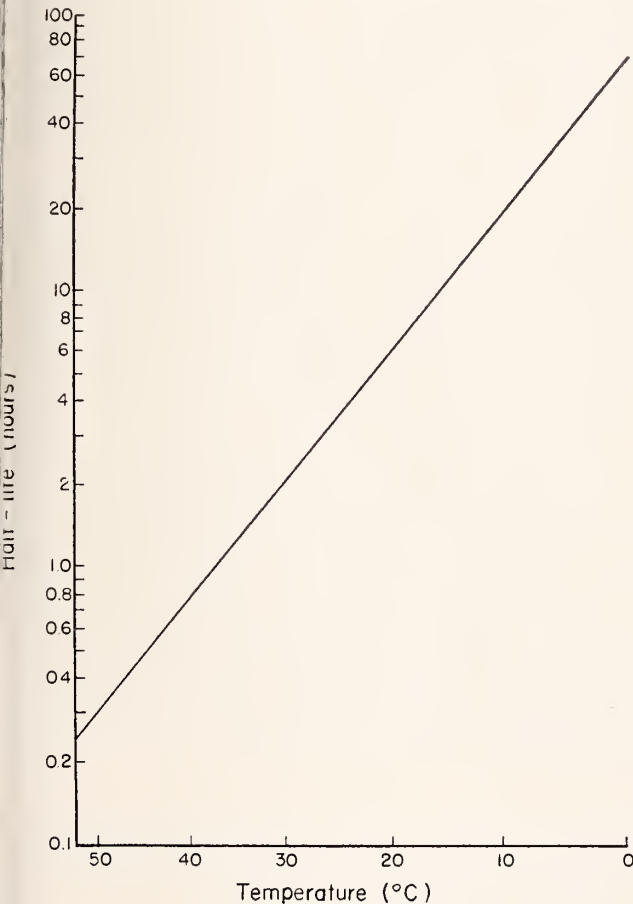


Fig. 1. The half life of beta-propiolactone in water at different temperatures.⁹

The following basic solution is prepared:

0.9% (physiologic) Saline.....	500 cc.
Sodium bicarbonate.....	8.4 gms.
Phenosulfonphthalein (Phenol red)	12 mgm.

Since a bicarbonate solution cannot be autoclaved for sterilization, a solution of sterile bicarbonate containing 3.75 gms. NaHCO_3 in 50 cc. of distilled water, sealed in glass ampules as is readily available from commercial drug houses,* is used. Approximately 400 cc. of sterile saline are poured into the sterile jar and two 50 cc. ampoules of bicarbonate and six ampoules of phenol red indicator are added.

To this solution are added 4.4 cc. of beta-propiolactone, measured with a syringe. The graft

to be sterilized is immediately placed in this mixture and that stirred so the entire flask is coated with the solution. This solution now contains one per cent beta-propiolactone by weight, the con-

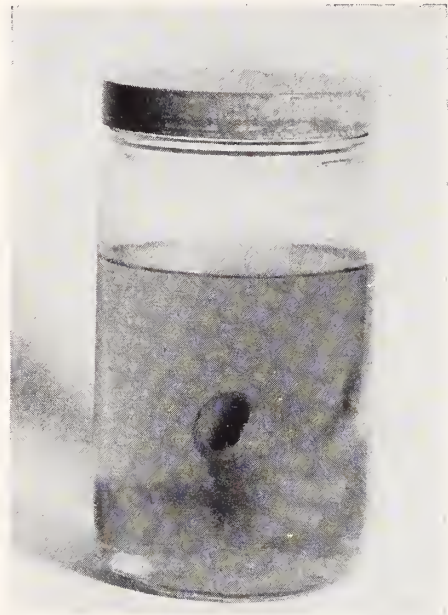


Fig. 2. A sterile arterial homograft as prepared for storage.

centration found to be most effective in sterilizing grafts. The jar is then placed in a water bath at 37°C . for two hours. At thirty minute intervals, the pH of the solution is checked by noting the color of the phenol red indicator. The indicator is orange in an acid media and red in the desired range, (pH of 7.4). Sterile 0.1 molar NaOH is added in sufficient quantities to keep the reaction basic. At times this may require the addition of approximately two to three hundred cc. We add 0.9 cc. of beta-propiolactone for each 100 cc. of the 0.1 molar NaOH added to maintain the one per cent solution of the sterilizing agent during the entire procedure.

At the end of a two-hour period of sterilization, the graft is transferred to a 0.2 molar phosphate buffer-solution (pH 7.4) and rinsed. Either this sterile saline-bicarbonate solution (outlined above) or a balanced salt solution, such as Ringer's solution,* can be used. After rinsing, the graft is placed in either fresh Ringer's solution,* Hank's solution,** or the saline-bicarbonate-phenol red solution (as above) and refrigerated at $1^\circ\text{--}4^\circ\text{C}$. After twenty-four hours, a sample of the fluid and a piece of the graft are taken for culture and

*Mead Johnson & Co., Evansville, Indiana.

**Microbiological Associates, Washington 14, D. C.

*Abbott Laboratories, North Chicago, Illinois.

1,000,000 units of penicillin and one gram of streptomycin are then added. If the results of the culture are sterile, the graft may safely be used.

Grafts so stored should be used within sixty days.



Fig. 3. An arterial homograft used to replace an aneurysm of the lumbar aorta.

If it is desired to keep them longer, up to a year, they should be preserved by quick freezing. Place the sterilized graft in a sterile empty pyrex tube of suitable size. Seal it with a tight-fitting rubber stopper and cover with sealing wax. Immerse it in a mixture of equal parts dry ice and absolute alcohol (or acetone), with the temperature -72° to -76° C. An "insulated ice bucket" of the home type is an excellent container for this ice-alcohol preparation. One should guard the hands against frost-bite when working with such agents.

While the contents of the sealed tube are freezing, the dry ice-alcohol mixture will "boil" for five to ten minutes. After fifteen minutes the tube can be removed and placed in a standard deep freezer at -10° C. for storage until the time of utilization. In this fashion, grafts may be stored for periods up to one year.

The grafts may be thawed for use by placing the sealed tube in warm water (37° C.) for ten to fifteen minutes and then aseptically removed from the container and placed in 500 cc. of saline with penicillin, streptomycin, and 50 mgm. of heparin. A graft should not be thawed more than once and should be used as soon as possible after thawing.

TABLE I. ARTERIAL HOMOGRAFTS

Artery	Lesion	Number	Successful	Failure	Expired
Subclavian	Occlusion	2	2		
Aorta	Aneurysm	16	14		2
Aortic bifurcation	Aneurysm	11	7		4
Aortic bifurcation	Occlusion	3	2		1
Aorta-Femoral	Occlusion	2	1	1	
Iliac	Occlusion	1	1		
Iliac	A/V Comm.	1	1		
Femoral	Occlusion	3	3		
Femoral	A/V Comm.	1	1		
Femoral vein	Trauma	1		1	
Totals		41	32	2	7

Results

To date, forty-one arterial homografts sterilized in this manner have been placed in patients (Table I). The grafts are uniformly soft and pliable after this kind of preparation and aside from a red stain imparted by the indicator, are difficult to differentiate from a fresh vessel. These patients have been observed from three months to three years. There has been no late rupture in this series and but two late occlusions. In addition, an arterial homograft replacing a common femoral vein which had been destroyed by a gun shot wound functioned for ten days. This was as long as expected and an adequate interval for the development of sufficient collaterals to protect the extremity (Fig. 3).

Discussion

Until further studies in fat metabolism and its transport lead to better prevention for arteriosclerosis, vascular replacements are certain to be required for the more seriously diseased areas. Too, the increasing incidence of automobile accidents in which there is a serious loss of arterial structure creates additional need for suitable vascular substitutes.

The techniques herein presented for homograft sterilization and preservation are both simple and satisfactory. No special and expensive apparatus is necessary. The estimated cost per graft is less than one dollar. Although large homograft banks responsible for service to many hospitals must have a method of easy transportation of sterile grafts over large areas and will continue to utilize the freeze-dry techniques of arterial preservation, the smaller community will find these techniques we have described suitable for their more limited use.

(Continued on Page 724)

Iatrogenic Atherosclerosis

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IT IS NOW virtually an accepted fact that high fat diets in large population groups over a period of many years predispose to consistently high serum cholesterol levels and a high incidence of atherosclerosis.¹⁻⁴ The idea of iatrogenic atherosclerosis came by following reports of these recent studies while simultaneously prescribing therapeutic diets for diabetic and ulcer patients. We Americans eat more fat than any other people,¹ and American physicians are prescribing diabetic, ulcer and even some reducing diets which contain more fat than the average population consumes. Furthermore, we have been prescribing these same diets for the past ten to twenty years. The average fat intake of the American people ten to twenty years ago was 10 per cent to 20 per cent less than it is today.¹ Diabetic and ulcer patients as a group have an incidence of atherosclerosis roughly twice that of the general population.^{5,6} Is it not likely that we have contributed to this astounding mortality rate by our diet prescriptions?

There is no question that there are anatomical, hormonal, familial and perhaps racial factors in the pathogenesis of atherosclerosis.⁶ However, the evidence now points toward the concept that these are minor factors, while the major factors lie in fat metabolism.⁷⁻¹⁰ Populations with a high percentage of total caloric intake in the form of fat have high serum cholesterol and a high incidence of atherosclerosis and vice versa.^{4,11,12} The exact roles of the unsaturated fats versus the saturated fats, total serum lipids versus serum cholesterol and total lipoprotein versus Sf 10-20, or Beta lipoproteins, are still controversial.

Patients with diabetes, chronic peptic ulcer, myxedema, nephrosis, lipoid dystrophies, obesity and hypertension have higher incidence of atherosclerosis than the general population. In the last forty-five years the American population has increased its fat consumption from 32 per cent of the total calories to 42 per cent.¹ During this same time the incidence of coronary atherosclerosis has

increased two to three-fold. There is also a definite tendency for atherosclerosis to develop at a younger age.^{1,13} Physicians in general, and internists in particular, therefore have an obligation to prescribe diets which tend to delay the development of atherosclerosis.

TABLE I-A. GENERAL DIETS

	P	C	F	Cal.	% F. Cal.
#1	89	247	159	2775	51.6
#2	72	266	137	2585	47.7
#3	90	293	131	2711	42

TABLE I-B. MODIFIED AND SPECIAL GENERAL DIETS

	P	C	F	Cal.	% F. Cal.
#1	77	254	60	1859	29
#2	65	262	62	1866	30
#3	85	258	61	1920	28.5
Special	98	409	56	2534	21.8

An analysis of three general diets as served in one of our hospitals is presented in Table I-a. The percentage of calories derived from fat is above the national average of 42 per cent. Table I-b shows a modification of these three general diets and a special low fat general diet. In the three general diets, fried foods, fatty meats, gravies, cream and cream products, and rich desserts were omitted, and the amount of butter was kept at a minimum. The reduction in fat is modest, but it is reduced to the level consumed in America in 1910 when the incidence of atherosclerosis was much lower than now.

For people to follow a reasonable low fat diet, it is necessary that the diet be palatable and practical. Therefore, with the co-operation of my wife, I attempted to follow the general principles and still live normally. A new recipe book written by the wives of Dr. Eugene Stead and Dr. James Warren entitled "Low Fat Cookery"¹⁴ was used at home. Food eaten at restaurants and dinners away from home was selected within the limits of practicality and good manners. The special general diet shown in Table I-b represents the averages of one week of menus of this diet. The week included

Presented at the meeting of the Minnesota Society of Internal Medicine, Red Wing, Minnesota, May 25, 1957.

TABLE II-A. ULCER DIETS

	P	C	F	Cal.	% F. Cal.
#1	50	50	115	1435	72
#2	112	259	152	2852	48
#3	110	315	147	3023	43.8

TABLE II-B. MODIFIED ULCER DIETS

	P	C	F	Cal.	% F. Cal.
#1	60	90	65	1185	49
#2	106	290	108	2556	38
#3	115	307	119	2760	39

six lunches and one dinner eaten away from home. Occasionally meals away from home were unavoidably high in fat, but these were balanced by several very low fat meals. I was quite surprised at the degree of reduction, the relative ease of success, and the general acceptability of the diet. This diet represents the result of eliminating all possible sources of fat in a person who wants moderately large servings of meat. It does not contain much added unsaturated fats. Corn oil was used in small amounts only. If one wanted to maintain the same percentage of fat calories and add more unsaturated fats, a reduction in the quantities of meat would be required. Substitution of fish for several meals each week might be done as a compromise.

Table II-a shows an analysis of the commonly prescribed ulcer diets. These are standard ulcer diets used widely in the medical management of peptic ulcer. They employ large amounts of milk, cream and butter. The percentage of calories derived from fat is therefore the highest of any diets analyzed.

Table II-b shows a simple modification of these diets. Half-and-half was changed to whole milk, and butter and other fats were reduced moderately. Since the effect of fats on stomach secretion and motility is a desired response in medical management of peptic ulcer, greater difficulties in management might be anticipated with low fat diets. The presented modifications therefore represent a compromise between the high fat diets usually prescribed and the 20 per cent fat calorie diet considered most desirable to reduce atherosclerosis. These modified diets have been tried on several ulcer patients with good results. Actually, the modified diets are more acceptable to most patients than the high fat diets.

Diabetes is an important disease from the standpoint of dietary prescription and the development of atherosclerosis. Particularly important is the

TABLE III. DIABETIC DIETS

	P	C	F	Cal.	% F. Cal.
ADA #1	60	125	50	1200	37.5
ADA #2	70	150	70	1500	42
ADA #3	80	180	80	1800	40
ADA #4	90	220	100	2200	41
ADA #5	80	180	80	1800	40
ADA #6	100	250	130	2600	45
ADA #7	140	370	165	3500	42
ADA #8	115	250	130	2600	45
ADA #9	120	300	145	3000	40
1½ P, C/F=1½/1	112	213	142	2578	49
1½ P, C/F=2/1	112	255	127	2621	44
1½ P, C/F=3/1	112	309	103	2611	35.5

TABLE IV. MODIFIED DIABETIC DIETS

	P	C	F	Cal.	% F. Cal.
ADA #7 (a)	140	370	50	2465	18
ADA #8 (a)	115	250	50	1880	24
ADA #9 (a)	120	300	50	2145	21
Special	104	314	48	2104	20.5

group of juvenile or young adult diabetics. A great many of the young diabetic patients develop the complications of diabetes before reaching old age. It is certainly the physician's responsibility to do the best possible for these people. Diabetic patients have been treated with high fat diets for many years to avoid carbohydrates as much as possible. Recently, the trend has been toward a more normal type diet with only the elimination of sugar. Actually, it is difficult to see any real reason to forbid all sugar, unless it is because we don't trust our diabetic patients to regulate the amount. Butter on their bread may be more harmful to them than jelly or jam.

Table III shows the composition of twelve diabetic diets.¹⁵ The percentage of calories derived from fat can be seen to equal or slightly exceed the national average. When consideration is given to the fact that almost all persons with diabetes lose part of their ingested carbohydrate in postprandial glycosuria, it becomes apparent that their metabolism is derived even more from fat than these figures indicate.

Table IV shows a modification of American Diabetes Association diets #7, #8 and #9, and a special diabetic diet formulated and tried by the author. The fat exchange (1 tsp. butter, or equivalent) of ADA diets were eliminated and whole milk was changed to skim milk or buttermilk. In the special diet, the same principle was followed, but the patient was allowed three fat exchanges a day. This patient is a thirty-nine-year-old housewife with moderately labile diabetes of two years' duration requiring 25 units of NPH insulin daily. She understood the principle of the diet readily

TABLE V. REDUCING DIETS

	P	C	F	Cal.	% F. Cal.
t1	65	67	31	800	34.6
t2	65	70	51	1000	45.9
t3	70	95	60	1200	45
t4	80	118	84	1500	48.8

and considered the diet entirely acceptable. She has been well controlled on this diet for about eight months, except for one episode of acidosis associated with an acute streptococcus pharyngitis. The only adjustment necessary was an increase in the amount of the bedtime lunch.

The only reference found in textbooks on low fat diabetic diets was a statement from the new text by Danowski,¹⁶ which is quoted as follows:

... Evidence is accumulating that the incidence and intensity of atherosclerosis changes in populations as a whole are correlated not only with total calories, but the proportion of fat in the diet. It seems probable therefore that diabetic diets may also have too large an intake of fat. It seems reasonable to try in the next decade or two dietary prescriptions which are lower in fat content and perhaps with the source of fat, i.e., animal versus vegetable, and the type of vegetable fat, specified in the hope of reducing the incidence of nephropathy, retinopathy and arteriosclerosis in the diabetic."

Table V shows the summary of four reducing diets given in a book on therapeutics.¹⁷ Even reducing diets are being prescribed which are high in fat. People who are reducing are necessarily burning depot fat every day in addition to their dietary intake. Therefore, a person on any of these reducing diets actually is metabolizing a considerably higher percentage of his calories from fat than the table indicates. This is not difficult for the physician to change, since many reducing diets follow the general principle of qualitatively eliminating all possible fats and greatly restricting all refined carbohydrates.

Conclusion

The convincing statistical parallelism between high fat diets and high incidence of atherosclerosis suggests a need for reappraisal of diet therapy.

The proportion of total calories derived from fat in three general diets in a local hospital ranged from 43 per cent to 52 per cent. This is compared with the national average of 42 per cent in 1955 and 32 per cent in 1910. The percentage of fat

calories in prescribed ulcer and diabetic diets ranges from 36 per cent to 72 per cent. A group of reducing diets showed a range of 35 per cent to 49 per cent.

The higher incidence of atherosclerosis in diabetic and ulcer patients may be partly iatrogenic because of the high fat diets prescribed.

Suggested modifications are given which reduce the percentage of fat calories in prescribed diets to a range of 18 per cent to 30 per cent.

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Trigeminal Neuralgia

One Hundred Fifty Years of Nonsurgical Treatment

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A DETAILED review of medical literature concerning the nonsurgical treatment of trigeminal neuralgia for the past 150 years would be arduous for the author, tedious to the reader and profitable to neither. I have attempted to choose examples of the major fads in treatment, outstanding for their popularity or for their novelty. In most instances only one or two authors are cited. These are usually men who first advocated the method of treatment or who have written papers that are considered to be of more than average interest. The term "nonsurgical treatment" as used herein will exclude measures such as extraction of teeth, operations on the nose and sinuses, injection of noxious substances into the fifth cranial nerve or its branches, and a variety of pullings, stretchings, burnings and cuttings of the nerve. Other measures intended to relieve the pain of trigeminal neuralgia will be included.

It is not proper to enter, here, into the controversy as to who first described trigeminal neuralgia. For practical purposes our present-day knowledge of the condition begins with Fothergill¹ who, in 1776, reported "Of a painful affection of the face." In an attempt to bring relief to his patients he gave them hemlock. This is probably the same drug that was used to bring about the untimely demise of Socrates, but in the hands of Fothergill it was employed in modest doses. At that time it had a reputation for curing cancer and phthisis, and for a while it seemed to relieve the pain of trigeminal neuralgia. After the contribution of Fothergill, interest in trigeminal neuralgia grew and so did the number of remedies. In 1825, Blackett² summarized progress to that date as follows: "In the treatment of this disease physicians

and surgeons . . . have their different theories and modes of treatment; of their inefficacy we have abundant and melancholy proofs." If he were here today he would have little cause to alter his opinion. A few years later, Chapman³ complained, "Even up to the present moment the medical journals teem with fresh contributions to the overgrown and redundant accumulations of remedies."

In 1786 Blunt⁴ reported his experience in treating a painful affection of the face. He recognized the condition to be the same as that described by Fothergill and used the extract of hemlock. By this time the drug had passed its prime and was quite ineffective. "In this distressful situation I recommended to her electricity." The lady accepted this and Blunt goes on to say, "I electrified her twice that day." Used by Chaucer this sentence would have had a much different meaning. Blunt intended to convey the information that he had used electricity to produce sparks and shocks to "the part which had been uniformly the seat of pain." After three days of treatment the patient was relieved and did not suffer recurrence of pain for the next three years, that is, up to the time of the report.

During the nineteenth century, Faraday, D'Arsonval, Hertz and others greatly advanced our knowledge of electricity. Medical uses for some of these advances were discovered. Galvanism,^{5,6} high-frequency current,⁷ diathermy,⁸ and rapid sinusoidal current⁹ were all used with signal success to salve the pain of trigeminal neuralgia. Finally, in 1949,¹⁰ it was discovered that these pains could be dissipated during the course of electroshock therapy given for emotional disorders.

A continued consideration of physical measures used to treat this condition seems appropriate before turning to other methods. Colville,¹¹ in 1814, cured a man by vigorously rubbing tar into the afflicted side of the face. Whether this should be considered a physical measure is, perhaps, open

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o doubt, but the massage may be enough to make it qualify. Baird¹² used steam directed, of all places, onto the abdomen of a young lady who suffered from this malady. If you wonder why the abdomen, the explanation is this: *Tic douloureux* was thought in that time to be secondary to some vague but virulent disorder of the digestive organs. It had become known that the sympathetic nerves were arranged up and down the trunk, that they extended into the neck and that they ended intracranially in the region of the fifth cranial nerve. This fragile fact was all that was needed to provide a theory, and was used to justify this and subsequent treatments. Winteritz¹³ and Walker¹⁴ applied ice to the face of the victim as often and as long as he could bear it. By this means they were able to "cure" patients in whom "all other methods of treatment had failed." A gentleman by the name of Neale¹⁵ reported on the use of an instrument which he called a "vibrator." His description suggests that it was somewhat like a Lilliputian jackhammer. The instrument was applied over the painful regions of the face. He was of the opinion that by pummeling, he could palliate the prosopalgia of any poor wretch who came his way.

More strictly medicinal measures also were used in the early treatment of trigeminal neuralgia. Pearson¹⁶ used mercury with heroic vigor. The patient took it by mouth as calomel and it was rubbed into the skin in the form of mercury ointment. Treatment was continued until it produced stomatitis and gingivitis just short of spontaneous shedding of the teeth. One lady, quoted by Pearson, stated of her pain, "There was no lasting relief till the sore mouth and the spitting came on." This same author noted that some patients complained more of the evil effects of the treatment than of the pain caused by *tic douloureux*. McKechnie¹⁷ used arsenic solution in a wonderful and fearful manner. The drug was given in increasing doses until "sensible signs of the operation of the medicine would be observed." This was a gentle way of saying that the patient was poisoned with arsenic. Next came "the bark,"¹⁸ that is, quinine, which was used because the pain was thought to be rheumatic. Whatever the reason, quinine seemed effective for a time. The use of iron carbonate became common about 1820. It was given in large doses—up to 8 ounces in thirty-six hours²—to the point that it produced constipation, diarrhea, or sore mouth. Beale¹⁹ wrote, "This is

one of the most fortunate discoveries, in curing a disease formidable alike from its obstinacy and its violence." The heyday of this drug lasted about fifteen years, but its use was revived as late as 1949 by Davidoff and Feiring.²⁰

Translation into English of a paper by Magendie²¹ awakened interest in the use of hydrocyanic acid as a medicinal agent (1818). As late as 1838 its use was hotly defended by Hall.²² Taylor²³ used a dilute solution of this violent poison to relieve the pain of trigeminal neuralgia. His report includes observations on patients for as long as three and one-half years after pain was stopped. One wishes that some present-day medical scientists would be as patient in reporting their results. Loudon²⁴ advised the application of an emplastrum of laurel leaves to the face. He found this poetic sounding remedy to be extremely efficacious. Laurel leaf was known to be poisonous if taken internally owing, in part, to its content of hydrocyanic acid.

In the 1820's accounts of cures by means of purgatives began to appear in the literature. Their use was predicated on the afore-mentioned theory, and the preparations included awesome mixtures of calomel, croton oil, and antimony tartrate. One author²⁵ mentioned that, when his patient had recovered from the treatment sufficiently to walk, he left the hospital completely cured of his pain. One is impressed by the frequent use of the word "cure" to describe the outcome of treatment for this condition. Evidence for cure often took the form of a statement that the patient failed to return to the physician and therefore cure might be assumed. Other explanations for the patient's failure to return will occur to the reader. A late reference to the use of purgatives for this condition is that of Gill²⁶ in 1905. He gave one ounce of castor oil daily for fourteen days. When I think of how present-day patients complain of taking a single dose of castor oil I reflect, "There were giants in the earth in those days," and our patients seem a pallid lot by comparison. Chapman³ advocated "puking" as the best treatment. It failed to become popular.

In Boston, in 1846, Morton demonstrated the anesthetic properties of ether. Sibson²⁷ was a fellow who kept posted on such matters, and in 1847 he published a modest article in which he claimed that the inhalation of ether was useful "as a means of cutting short the paroxysms . . . and of rendering the system amenable to a scientific treatment."

He did not elaborate on what this scientific treatment might be.

Trousseau²⁸ coined the term "epileptiform neuralgia" for trigeminal neuralgia because of its fancied resemblance to an epileptiform seizure. He was of the opinion that surgical operations for the relief of this pain were risky business and that all medical measures had been ineffective. For these reasons, he proposed the use of large amounts of opiate. One of his patients was given "15 à 20 centigrammes" of morphine sulfate per day (2.25 to 3.0 grains). This dose was gradually increased so that after the fifteenth day the patient took "jusqu'à 4 grammes de sulfate de morphine" each day (60 grains). Trousseau commented that these huge doses did not affect the patient's digestion or mentality, but the cost of the drug was ruinous. In order to avoid financial calamity, the patient purchased crude opium in kilogram lots and from this made "bols de 1 gramme." She would take ten to twenty of these each day as needed. The author went on to mention that the patient would have remissions of two or three months during which she would use no opium at all.

A strange name appeared in the long list of drugs used to treat trigeminal neuralgia when, in 1872, Legg²⁹ reported the successful use of croton chloral. This was a by-product of the manufacture of chloral hydrate and was thought to have the peculiar property of producing anesthesia of the head. It was later proved to be butylchloral hydrate with properties similar to those of chloral hydrate. With this damaging revelation its popularity waned. Thompson³⁰ used phosphorus and reported on its effects in twelve patients, a large number for those days. He admitted that it had a foul taste, but he was able to disguise it with spirits of peppermint so that his patients could be induced to take it. One of his patients enjoyed a "cure," ten "recovered," and one did not obtain any beneficial effect. This will compare favorably with many reports of today.

Beginning in 1874,^{31,32} there was a flurry of excitement over the use of *Gelsemium sempervirens* in the cure of trigeminal neuralgia. It was given in the form of a tincture which was thought to impair the sensibility of sensory nerves. If taken in large enough amounts it would produce giddiness or even unconsciousness. Nitrite of amyl was found by Evans³³ to be effective. His patients sniffed it to the point of giddiness or unconsciousness and were quite pleased with the results. Its

beneficial effects were still being reported as late as 1941.³⁴ Another vasodilator, nitroglycerin, was mentioned favorably in 1885 by Deahofe.³⁵

The writings of Trousseau caused Peter³⁶ to conclude that epileptiform neuralgia should be treated as epilepsy. He gave potassium bromide in doses of 6 gm. per day to accomplish this and his efforts were crowned with success. From 1878³⁷ to 1902³⁸ aconite was held in high esteem. The use of so-called heroic doses of strychnine was urged by Dana.³⁹ The treatment started with a dose of 1/30 grain each day and gradually increased to 1/4 grain each day. In addition he used eliminants, such as potassium iodide, and a tonic in the form of tincture of iron, plus rest in bed, light diet and diluents. This total "push" program may have kept the patients too busy to notice the pain.

The subject of endocrinology was not neglected. French⁴⁰ argued that persons with hypothyroidism may have many odd pains and those of trigeminal neuralgia might be included. He tested and proved this theory by relieving these pains with thyroid extract. Tracy⁴¹ reported the case of a man who complained of lacrimation and "much mucus in the mouth" during his bouts of pain. With this clue he was able to free his patient of pain by giving him pilocarpine until it produced dryness of the mouth.

The 1920's were relatively arid. In 1930 Ball⁴² was successful in alleviating pain owing to tic douloureux by means of artificial fever resulting from the injection of boiled milk. Later^{43,44} intravenous injections of typhoid vaccine were used for the same purpose and with the same good results. In view of the beneficial effects of vasodilators, such as amyl nitrite and nitroglycerin, it is a surprise to learn that Tyler⁴⁵ and Dichter⁴⁶ obtained equally good results with the vasoconstrictor ergotamine tartrate. Charlin⁴⁷ assumed that in some cases trigeminal neuralgia was related in some way to tuberculous toxemia; he was able to dispel the pains of these patients by injections of old tuberculin.

In 1940, the vitamin era was ushered in by Borsook and his associates.⁴⁸ They argued that the effectiveness of vitamin B₁ in relieving the pains of polyneuritis of alcohol and pregnancy might well carry over to the pain of tic douloureux. Their method consisted of injections of large doses of thiamine chloride and modification of the diet with nutritional supplements. There were no

"cures" but their patients, for the most part, were markedly improved or improved. Twelve years later a similar success was enjoyed with vitamin B₁₂.⁴⁹

The year 1948 was a good one for sufferers from tic pain. Bee venom,⁵⁰ dietary control,⁵¹ cupreone,⁵² and antihistamines⁵³ were added to the long list. Later, Stich⁵⁴ assumed that banthine inhibited the gasserian ganglion in the same manner as it did the autonomic ganglia. As evidence, he reported the case of a man who was able to control his pain by taking the drug every six or seven hours. The tranquilizers will not only ease mental anguish but they are reported to have a calming action on the pains caused by trigeminal neuralgia.⁵⁵

Finally, let us consider two drugs which are unusual in that their use was founded on astute observation and reasonably good logic. The first of these is trichloroethylene. This was used as a solvent in Germany during World War I. In 1915 Plessner⁵⁶ reported that one of the toxic effects of this substance was the production of neuritis of the sensory portion of the fifth nerve. A year later he reported that the use of this drug had relieved the pain of twelve of fourteen patients having trigeminal neuralgia. Glaser⁵⁷ reviewed the literature concerning this treatment in 1931 and found the proportion of patients benefited to be much smaller. Stilbamidine has been used in the treatment of certain tropical diseases for many years. One of its toxic effects is the production of sensory neuritis, usually limited to the head and neck. This property suggested its use for the treatment of trigeminal neuralgia. Smith and Miller⁵⁸ reported glowingly concerning its capacity to relieve pain caused by tic douloureux. Unfortunately, the neuritis which it produces may be associated with painful paresthesia as bad as or worse than the original pain.

That no regularly effective, nonsurgical treatment for trigeminal neuralgia has yet been proposed is the only conclusion to be derived from the information presented herein. This might suggest a second conclusion; that is, that no form of nonsurgical treatment should be used. I do not agree with this. Often a patient is seen at a time when his present attack gives promise of subsiding. Another patient may decline a surgical operation. A third, having sufficient pain to justify an operation under ordinary circumstances, may have some other illness which increases the risk of operation

so greatly that it must be avoided if possible. In each case, the patient expects and deserves that some effort be exerted to make him more comfortable. From this long list of remedies may be chosen one which suits the temperament of patient and physician and at the same time is relatively free from undesirable side effects. Its use may coincide with lessening of the pain and the patient will be gratified. A final lesson may be gleaned. Each of these remedies, with the possible exception of those which have come into use most recently, has enjoyed a measure of favor and fame only to slip into quiet oblivion. This suggests that any new nonsurgical measure for the relief of trigeminal neuralgia should be accepted with tolerant skepticism until sufficient time has passed to allow for mature consideration of its benefits and limitations.

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COLOR BLINDNESS

Some false notions about color blindness have been corrected by Commander Dean Farnsworth of the U. S. Naval Medical Research Laboratory, New London, Connecticut. Ten per cent of American men, but only one per cent of the women are color blind; it is inherited, usually from a man's maternal grandfather; it is not

curable nor can it be remedied; it cannot be acquired by alcohol, tobacco, sickness or any other means; color-blind persons, with a few rare exceptions, are not insensitive to all color.—17th Annual *Congress on Industrial Health*, Los Angeles, Feb. 4-6, 1957.

Primary Malignancies of the Lung

Advances in Diagnosis and Treatment

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IN THE LAST decade there has been great interest in the problem of carcinoma of the lung. This interest has been stimulated by an increasing awareness of the great strides that have been made in thoracic surgery during this time and the relative prevalence of this disease which now approximates carcinoma of the stomach in frequency among men. No longer does thoracotomy mean that the patient's cemetery lot should

TABLE I. CLINICAL CHARACTERISTICS OF THE MICROSCOPIC TYPES OF CARCINOMA OF THE LUNG

Cell Type	Number	Percent	Ratio Males : Females	Location
Small cell carcinoma*	90	9.0	29:1	Central
Adenocarcinoma	137	13.7	3:1	Peripheral** and Central
Large cell carcinoma	378	37.8	25:1	Central and Peripheral
Squamous cell carcinoma	395	39.5	6:1	Central
Total	1000	100.0		

From Moersch and McDonald¹, 1953.

* Also called oat or spindle cell

** Origin in tertiary or smaller bronchi

be readied. Instead, there has been an increasing realization that an exploratory procedure carries only a slightly more increased risk than laparotomy. Accordingly, a more aggressive approach to the problem of carcinoma of the lung is feasible. Coupled with this lowering of surgical risk have been advances in the diagnosis and basic understanding of this disease. Careful evaluation of the results that these changes in perspective have produced is now possible and, indeed, necessary to plot further the course which should be followed in the management of this disease. In the following paragraphs I shall review some of the important advances which have been made and evaluate them in the light of future progress to be made in treating these tumors.

One of the greatest advances in recent years in the diagnosis and treatment of carcinoma of the

lung has been the recognition of the implication of the microscopic classification of these tumors. It has been emphasized by Moersch and McDonald¹ that there are four main types of lung carcinomas—the squamous cell, large cell, small cell and adenocarcinoma. Table I summarizes the clinical characteristics of these groups as to relative prevalence, sex incidence and location in the tracheobronchial tree. In a series of 1000

TABLE II. OPERABILITY, RESECTABILITY AND SURVIVAL IN VARIOUS MICROSCOPIC TYPES OF CARCINOMA OF THE LUNG

Cell Type	Number	Percent Explored	Percent Resected*	Two Year Survival	
				Percent of Resected	Percent of Total
Small cell carcinoma	90	33	50	20	3
Adenocarcinoma	137	61	67	33	14
Large cell carcinoma	378	49	58	44	13
Squamous cell carcinoma	395	62	74	56**	26**

From Moersch and McDonald¹, 1953.

* Percent of those explored

** Calculated value

cases the two-year survival rate of patients with the various types of lesions is shown in Table II. The differences shown in the characteristics and behavior of these groups justifies this classification. It is apparent from these data that the prognosis for patients with squamous cell carcinoma who have undergone curative pulmonary resection is relatively good, but, on the other hand, the prognosis of individuals with small cell tumors is almost invariably bad. This fact is of extreme importance, in that we must not allow our approach to this problem to be colored by the results in unfavorable types of lesions. Further augmenting the obvious usefulness of the typing of the lesion by microscopic means, is the proven ability of the experienced pathologist to ascertain the histologic type of the lesion from an examination of suitably prepared sputa or bronchial washings. The decision for or against thoracotomy or the choice among the various resective procedures

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is influenced greatly by what the pathologist can tell us preoperatively.

Another advance of diagnostic importance has been the demonstration by Daniels² of the usefulness of prescalene node exploration and biopsy. Rouviere³ has demonstrated that these easily accessible nodes which lie just lateral to the clavicular attachment of the sternocleidomastoid muscle are way-stations in the pathway of lymphogenous spread of carcinoma of the lung to the great veins. Harken et al⁴ have shown that even without clinically palpable lymph nodes in this region, biopsy of the prescalene nodes frequently shows carcinomatous involvement. These workers have enlarged the scope of the biopsy procedure to include the upper mediastinum, using laryngoscopic visualization through the incision, but Connor⁵ maintains that the paratracheal biopsy is not necessary for satisfactory results from this procedure. A positive biopsy procedure gives positive information that the tumor has spread beyond the area of the usual surgical procedure and, of course, also allows a prethoracotomy microscopic diagnosis to be made. Involvement of these nodes limits any surgical attempts to palliative procedures which usually would not be indicated in the case of small cell carcinoma and would be limited to those cases where infection or hemorrhage was a problem.

Certain techniques of the pulmonary physiologist have been applied to the patient with carcinoma of the lung in an effort to avoid the postoperative problem of respiratory and cardiorespiratory failure. The thoracic surgeon who deals with pulmonary tuberculosis is aware of the problems encountered postoperatively from respiratory failure following excisional or collapse therapy. As has been pointed out by Woodruff et al,⁶ Gaensler et al⁷ and others, inadequate performance preoperatively of the maximal breathing capacity test heralds respiratory trouble postoperatively. In dealing with patients with carcinoma of the lung, this problem is usually not so acute but it is present. Certainly, any patient who shows evidence of the presence of specific or nonspecific fibrosis, old inflammation or emphysema in the contralateral lung should have an adequate preoperative evaluation of pulmonary function, using some of these carefully developed tests. Certainly attention should be given also to the capacity of the patient for physical exercise in evaluating pulmonary function.

The development of certain technical procedures in the last few years has allowed an extension of the scope of resective therapy. Mediastinal lymph node dissection en bloc with the tumor (Brock⁸, Watson,⁹ Gibbon et al,¹⁰ and Boyd et al¹¹) has been and is being done by some thoracic surgeons. The reported operative mortality rates following the use of these techniques are variable. It is too early to tell if this procedure is followed by a higher survival rate, and if this increased survival is not offset by increases in postoperative morbidity and mortality following possible interference with the blood supply of the bronchial stump. It is not unreasonable to suppose, however, that if applied to the squamous cell group of tumors it might increase the longevity of the patients so afflicted.

Resection of the carina and main stem bronchus (Paulson and Shaw¹²) has been accomplished with anastomosis of the distal bronchial stump to the proximal trachea. Portions of the trachea and bronchi have been excised with closure by certain plastic procedures using skin grafts (Gebauer,¹³ and Abbott et al¹⁴). These procedures are more applicable to the treatment of a certain less malignant group of lesions, the bronchial adenomas, or to save functioning lung tissue in patients with carcinoma who have limited respiratory reserves.

The controversy over the choice of pneumonectomy or lobectomy for malignancies of the lung still rages. Certainly there is justification for the more limited procedure in patients with reduced pulmonary reserves. As in the case of evaluating the more radical types of pneumonectomy, with the information available today, no definite decision can be made regarding the merits of lobectomy or pneumonectomy in carcinoma not involving or close to the main stem bronchus.

Progress has been made in clarifying the group of tumors known as bronchial adenomas. That these tumors do metastasize has been recognized. Soutter et al¹⁵ and McBurney et al¹⁶ have shown that of the two types of adenomas, the cylindroma and the carcinoid, the former is more prone to embolic spread. Certainly, these tumors merit removal. At times, a limited resection of the bronchus involved is possible; however, the frequently occurring obstructive pneumonitis and cavitation distal to these tumors often makes lobectomy or pneumonectomy mandatory. As was mentioned earlier, resection of the carina is now possible, and this is now preferable in some cases

to the endoscopic treatment of these previously inoperable carinal lesions.

Additional cases of pulmonary adenomatosis or alveolar-cell carcinoma have been reported, and the older cases have been summarized by Storey et al.¹⁷ Contrary to previous opinions, these authors feel that these tumors are not multicentric in origin, that in early cases they are not characterized by a bronchorrhea of glairy sputa and that, given adequate treatment, the prognosis for cure is as good or better than the ordinary carcinoma of the lung. Certainly, any one thoracic surgeon's experience with this tumor is not extensive enough to solve these points conclusively.

Improvement in the general outlook for the patient with carcinoma of the lung must of necessity come from three avenues of approach. These are either earlier diagnosis, more radical surgical treatment or the development of some new type of therapy. Appropriate to this discussion is an inquiry into the fate of those cases of carcinoma of the lung which were discovered by the routine chest x-ray. McNulty¹⁸ reported on the results obtained with the surgical treatment of thirty-nine cases of bronchogenic carcinoma discovered on a chest x-ray survey. Approximately two-thirds were resectable, but this improvement in resectability was not reflected in the overall three-year survival data of approximately 10 per cent. Conversely, Overholt et al.¹⁹ found a 30 per cent three-year survival in a group of thirty patients with bronchogenic carcinoma who were asymptomatic and whose cases were discovered on routine chest survey. Presumably the lack of symptoms in the patients of the latter group attests to their being earlier cases. For purposes of comparison, the two to five-year survival following surgical treatment of symptomatic lesions is approximately 10 to 15 per cent. Unfortunately, the information gained from these two reports is inadequate and no definite conclusions can be reached. It would be helpful to have a larger series of cases with information as to the histologic type of lesion.

Just what the newer, more radical surgical techniques have to offer remains to be determined. Perhaps in the case of the squamous cell tumors these procedures might be valuable. I suspect, however, that they will not better the results obtained with the other types of tumors.

There are no new therapeutic methods on the horizon. Radiation therapy (Mayer and Rosurt²⁰) occasionally is followed by a long term survival.

The newer techniques using radio-cobalt or high energy beta radiation are an improvement over the usual roentgen therapy, but probably will not change the overall picture appreciably.

It is hoped that the years ahead will bring answers to the questions centering on the extent of the operative procedure which should be used. Further experience with the treatment of the asymptomatic carcinoma should be recorded which would predict the usefulness of chest x-ray screening in selected population segments. The intimate association of this problem with the homotransplantation problem is readily apparent. Our attempts at radical surgery are severely limited by the necessity of preserving structures so close to the primary tumor. And, finally, we must recognize the association of the lung cancer problem with that of other neoplasias and look with hope on continuing fruitful work in these fields. Certainly, as this work is progressing we must not lose sight of the fact that the results following resections with the hope of cure in the squamous cell group of tumors are not as bad as with many other malignancies, there being a two to five-year survival of about 40 per cent.

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Three-Year Study of Neonatal Deaths in Hennepin County

BY THE HENNEPIN COUNTY
PERINATAL MORTALITY COMMITTEE

THE HENNEPIN County Neonatal Mortality Study* is an analysis of all deaths occurring in Hennepin County in infants of more than twenty weeks' gestation, who die within the first twenty-eight days of life. The study began January 1, 1952. It is a co-operative undertaking sponsored by the Hennepin County Medical Society, Minneapolis Pediatric Society, Minneapolis Obstetric Society, Minneapolis Chapter of the Academy of General Practice, Minneapolis Health Department, Minneapolis Hospital Council, Departments of Pediatrics and Pathology of the University of Minnesota Medical School, and the Minnesota Department of Health. The committee working on the study is composed of representatives from all these groups; members include obstetricians, pediatricians, pathologists, anesthesiologists, general practitioners, radiologists, public health physicians and hospital administrators. Information has been gained by the committee through conferences with hospital personnel on hospital prenatal care, the obstetric course, and infant evaluation, and from statistical data and forms furnished by the hospitals. These data have been transferred to punch cards for ease in tabulation. Analysis by the committee was entirely by code. Since no knowledge of the names of the patient, physician or hospital was given to the committee, each case could be discussed anonymously and impartially. Reports have appeared for 1952¹ and 1953.² Because the 1954 tables are very similar to the data presented for the two previous years of the study, a separate report will not be published. The 1954 data will be found in the Appendix (Tables A-J).

This paper is concerned with the total group of neonatal deaths of infants born in Hennepin County during the years 1952, 1953, and 1954. This study involves 1,012 infants, including thirty-

one sets of twins and one set of triplets, born to 988 mothers.

Types of Delivery

Almost 25 per cent of the deaths noted in this study occurred in infants whose mothers experienced breech deliveries. This is approximately four times the incidence of breech deliveries in normal newborns. Of the infants dying following breech delivery, 85 per cent were born prematurely (Table I).

TABLE I. TYPES OF DELIVERY
Mortality Study, 1952-1954

Type of Delivery	2500 Gms. and Under	Over 2500 Gms.	Total	Per Cent
Cephalic	416	219	635	62.7
Breech	214	36	250	24.7
Version and extraction	6	7	13	1.3
Cesarean section	73	20	93	9.2
Unknown	14	7	21	2.1
Total	723	289	1,012	100.0

Nine per cent of the deaths noted in this study occurred in infants whose mothers gave birth by cesarean section. Of these infants, 78 per cent were born prematurely. It is the opinion of the Hennepin County Perinatal Mortality Committee that flat plate abdominal x-rays should be taken in all cases before an elective or repeat cesarean section is performed, in order to determine whether or not the fetus' proximal tibial or distal femoral epiphyses have formed. These are usually observable by the fetal age of thirty-six weeks. By using abdominal x-rays as a guide for fetal maturity, prematurity, resulting from cesarean sections undertaken too early, can be reduced.

Duration of Life

Almost half of the deaths in this study occurred between one and twenty-four hours after birth. Approximately 75 per cent of the neonatal deaths occurred within the first two days. It is also

*Since 1955 the study has included fetal deaths and is now known as the Hennepin County Perinatal Mortality Study.

NEONATAL DEATHS IN HENNEPIN COUNTY

TABLE II. DURATION OF LIFE
Mortality Study, 1952-1954

Duration of Life	2500 Gms. and Under	Over 2500 Gms.	Total	Per Cent
Under 1 hour	97	32	129	12.8
1 to 24 hours	381	95	476	47.0
25 to 48 hours	120	53	173	17.1
49 to 28 days	125	109	234	23.1
Total	723	289	1,012	100.0

noted that only 125 out of 723 premature infants, or 17 per cent, died between two and twenty-eight days. Of full-term infants, 109 out of 289, or 38 per cent, died between two and twenty-eight days.

Causes of Death

The Committee has conscientiously attempted to determine the primary cause of death in each infant. Abnormal pulmonary ventilation, which accounted for nearly 60 per cent of the deaths noted in this study, included immaturity unqualified, atelectasis, and hyaline membrane disease. It is of interest that prematurity was associated with 90 per cent of the abnormal pulmonary ventilation deaths in this study (Table III).

Congenital anomalies accounted for 17.6 per cent of the deaths noted in this study. During 1952, 1953, and 1954, 17.4 per cent of the neonatal deaths that occurred throughout Minnesota were due to congenital anomalies. Congenital anomalies are, in contrast to abnormal pulmonary ventilation, more frequent in full-term infants. In this study, 37 per cent of the congenital anomaly deaths were found to occur in premature infants. Comparing causes of death for premature with cause of death for full-term infants, congenital malformations accounted for 9 per cent of the deaths of premature infants and 39 per cent of the deaths of full-term infants. Although many congenital anomalies cannot, at the present time, be adequately corrected, early diagnosis of the newborn will reveal some congenital anomalies amenable to medical and surgical care. For example, if the newborn is observed to have frothy mucus forming at the lips and severe coughing following the first feeding, a presumptive diagnosis of esophageal atresia and tracheo-esophageal fistula may be suspected. All newborn infants should be carefully observed for congenital anomalies which may interfere with the vital processes of respiration, swallowing, and elimination of stools and urine. Almost all normal newborn infants

TABLE III. CAUSES OF DEATH
Mortality Study, 1952-1954

Cause of Death	2500 Gms. and Under	Over 2500 Gms.	Total	Per Cent
Abnormal pulmonary ventilation	538	60	598	59.1
Congenital anomalies	66	112	178	17.6
Infection	30	28	58	5.7
Birth trauma	35	23	58	5.7
Blood dyscrasia	14	39	53	5.2
Anoxia	20	11	31	3.1
Others	20	16	36	3.6
Total	723	289	1,012	100.0

pass urine and stools within the first twenty-four hours;³ failure to do so may indicate obstruction.

Infection accounted for 5.7 per cent of the deaths noted in this study. This indicates that more adequate care of the infant is needed. It is the opinion of the Hennepin County Neonatal Mortality Committee that antibiotics should be given to all infants whose mothers have ruptured membranes twenty-four hours before delivery.

In addition to routine examination on all newborns, any infant, who, in the newborn period seems to be listless, takes feedings poorly and has attacks of cyanosis, should have a thorough work-up to exclude possible infection, birth trauma, or congenital anomaly. Congenital anomalies should be suspected and may coexist with an infection. Earlier detection and more adequate care of the newborn infant who is found to have an infection must be undertaken by all physicians responsible for obstetric and newborn care.

Birth trauma accounted for 5.7 per cent of the neonatal deaths reported in this study. It accounted for 8 per cent of the deaths of full-term infants and 4 per cent of the deaths of the premature infants. According to the Minnesota Maternal Mortality Committee,⁴ proper obstetric care should include adequate clinical pelvimetry, particularly of the anteroposterior diameter of the inlet (internal) and intertuberous diameter, plus a necessary knowledge of pelvic architecture. Mid-forceps may be associated with birth trauma. There is no indication for high-forceps. In general, no infant should be delivered through an incompletely dilated cervix.

Blood dyscrasia accounted for 5.2 per cent of the neonatal deaths reported in this study. These deaths were all attributable to erythroblastosis fetalis, except for one death from congenital leukemia. Almost 2 per cent of the deaths of

NEONATAL DEATHS IN HENNEPIN COUNTY

TABLE IV. AUTOPSIES BY INFANTS' BIRTH WEIGHT
Mortality Study, 1952-1954

Weight	Number and Percentage of Infants Autopsied							
	1954		1953		1952		1952-3-4	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
2500 grams or less (premature)	134/215	62.3%	140/270	52%	122/238	51%	396/723	54.8%
Over 2500 grams (full-term)	75/85	88.2	95/109	87.1	74/95	77.9	224/289	81.4
Total	209/300	69.7	235/379	62.0	196/333	59.0	640/1012	63.2

TABLE V. RATING OF NEONATAL DEATHS
Mortality Study, 1952-1954

Classification	2500 Gms. and Under	Over 2500 Gms.	Total Number	Per Cent of 1012 Neonatal Deaths
I. Preventable factors	32	42	74	7.3
II. Non-preventable	676	224	900	88.9
III. Unclassifiable	15	23	38	3.8
A. Obstetrical	592	95	687	67.9
B. Pediatric	126	199	325	32.1
C. Inadequate hospital facilities	0	1	1	0.1
D. Medical	29	12	41	4.1
1. Inadequate prenatal care	16	5	21	2.1
2. Family at fault	83	43	126	12.5
3. M.D. error of judgment	35	37	72	7.1
4. M.D. error of technique	3	5	8	0.8
5. Intercurrent disease	6	9	15	1.5
6. Unavoidable disaster	669	217	886	87.5

the prematures was due to erythroblastosis. The Minnesota Maternal Mortality Committee recommends that all mothers have Rh typing early in pregnancy. If the mother is Rh negative, an Rh test should be done on the father. It is the opinion of the committee that all infants born to Rh negative mothers and Rh positive fathers should at least have an Rh and Coombs test done on the cord blood at birth. If the Coombs test is positive, or if jaundice appears within the first twenty-four hours after birth, the infant has erythroblastosis and should have an early pediatric consultation so that definitive therapy can be given.

Anoxia accounted for 3.1 per cent of the neonatal deaths reported in this study. The Study Committee recommends that fetal heart rates be recorded regularly throughout labor. Too often fetal heart tones are not recorded on the chart. Any marked change in the fetal heart rate may indicate fetal distress, such as a prolapsed cord.

Miscellaneous conditions accounted for 3.6 per cent neonatal deaths noted in this study. The mis-

cellaneous conditions found through this study included tetany of the newborn, ascites of unknown cause, and various undetermined causes of death of some full-term infants.

Autopsies

There has been a continuous increase in the number of autopsies performed. (Table IV). During the three-year study, 54.8 per cent of the prematurely born infants who died were autopsied, 84.4 per cent of the full-term infants who died had autopsies. For all neonatal deaths the average autopsied was 63.2 per cent.

Rating on Neonatal Deaths

Preventable factors were found in forty-four obstetric, ten obstetric-pediatric, nineteen pediatric, and one hospital death during the three-year study. Thus, seventy-four out of 1,012 neonatal deaths, or 7.3 per cent were judged by the Committee to have preventable factors. (Table V). However, improvement in care (numbers 1-5) may have been possible in an additional 17 per cent of the deaths.

Examples of deaths with preventable factors are:

Case 1.—At forty weeks of gestation, the mother entered the hospital in labor. The total length of labor is not known. The fetal presentation was frank breech. Fetal heart tones were not recorded during labor or delivery. A soap-suds enema was done on admission of the mother. One and one-half hours following admission, the membranes were artificially ruptured. Delivery began five minutes following rupture of the membranes along with a 1 per cent novocaine pudendal block. Nitrous oxide-oxygen and cyclopropane were administered during the delivery. A left lateral episiotomy was performed. The infant seemed to make normal progress, and the shoulders were delivered twelve minutes following the onset of delivery. The pelvis then seemed too small for the infant's head to go through. Pressure on the mother's abdomen had no effect. The physician who had been caring for the mother during the entire pregnancy then applied Piper forceps to the head in a transverse application. On traction, the forceps slipped

off and had to be reapplied. Delivery of the head was accomplished eight minutes following delivery of the shoulders, twenty minutes following onset of delivery. The total blood loss was 200 to 300 cc. and the mother was given 500 cc. of blood.

The infant weighed nine pounds, two ounces. Bruises were noted over the infant's left eye and on the side of the head in front of the ear. Tracheal aspiration was performed, with removal of much fluid. The infant did not breathe at any time. Mouth-to-mouth resuscitation was performed, and the infant was then transferred to an Air-lock. At thirty-five minutes of age, the infant's heart beat ceased, and the baby was pronounced dead. Autopsy examination was normal, except for the head. There was a subperiosteal hematoma present over the entire cranial vault, especially on the right side. The scalp itself showed considerable discoloration, the temporal bones showed fractures on both sides. The fractures extended from the anterior margin to about the center of the bone on the left side, and from the posterior margin to involve about two thirds of the width of the bone on the right side. On both sides, the fractures extended through the full thickness of the bone. The dura did not seem to be torn. The cerebrospinal fluid was bloody over the entire surface of the brain. There was a laceration of the falx just posterior to the central portion, and, in addition, there was a complete tear of the left half of the tentorium and about half of the right tentorium. The interior of the brain and the ventricles showed no evidence of hemorrhage and there was no necrosis or other gross change.

Committee comment.—It is generally agreed that any breech presentation should be carefully observed and managed because of increased fetal mortality and trauma to maternal tissues. This is especially true in frank breech cases with suspected large babies, and in elderly primiparas. Prenatal care should be of such a nature to make one aware of potential disproportion between the passenger and the passage. X-ray pelvimetry should be done in all suspected cases before onset of labor. X-ray will also show if the head is flexed or extended. Consultation is advisable. Indicated cesarean section should be elective. Preservation of membranes is advisable. Early and frequent rectal examinations, frequent auscultation and abdominal palpation must be done to evaluate properly the progress of labor. Vaginal examination is frequently advisable after rupture of membranes. Breech should usually be allowed to dilate both cervix and vagina, and labor should be permitted to continue until the umbilicus is delivered, if no difficulty is encountered. Hasty and careless traumatic use of forceps on the after-coming head is ill-advised.

Case 2.—A seventeen-year-old primipara had had some bleeding, amount not known. She was admitted to the hospital at thirty-seven weeks of pregnancy. Hemoglobin on admission was 71 per cent, and she was given two blood transfusions on the day of admission. No consultation was obtained. On the day following admission, she had a cesarean section (nitrous oxide-oxygen anesthesia) because of suspected placenta previa. The infant weighed 4 pounds, 6 ounces, was pink at delivery, and cried in one minute, but then developed cyanosis and was given oxygen. A portable chest x-ray was interpreted as revealing neonatal atelectasis. The respirations became more labored, the feet became edematous, the color remained cyanotic in oxygen, and the infant expired at twenty-six hours of age. An autopsy was not performed, and the cause of death was listed as prematurity.

Committee comment.—In this case, the record was inadequate. No consultation was obtained. Placentogram often aids in the diagnosis of placenta previa. Frequently an expectant hospital management with sensible precaution does not compromise the mother's safety. In the interest of the fetus and avoidance of fetal wastage, the best possible procedure is further prolonging gestation whenever possible.

Case 3.—A twenty-six-year-old mother (four previous full-term infants) had diarrhea and fever for one week prior to delivery. Her first prenatal visit was eight days before delivery. The fetal age was thirty-six weeks, presentation of infant vertex. After seven hours of first stage labor, second stage twenty minutes, she had spontaneous delivery by her obstetrician of an infant weighing 5 pounds and 11 ounces. No anesthesia was used. The mother had 600,000 units of penicillin on the day of delivery. On the day after delivery, the mother's temperature rose suddenly to 103°. A urinalysis and urine culture were both negative. No stool cultures were done, and the diarrhea ceased following delivery. The mother was given aureomycin daily, starting on the day after delivery, and she was afebrile and clinically well on the fifth day when she was discharged with her infant.

At birth, the infant breathed well and a physical examination by a physician was normal. The infant's temperature was 97 to 99° throughout the hospital stay. At two days of age, the infant's hemoglobin was 18.5 grams per cent. No other laboratory tests or cultures were done on the infant. At five days of age, the infant was discharged on an evaporated milk formula, having gained 80 grams over the birth weight of 2600 grams.

At seven days of age, the infant began having loose yellow stools and vomited once. At eleven days of age, because of continued diarrhea, the infant was seen by the physician, who discovered that the mother had not been boiling the water. Physical examination disclosed severe excoriation of the buttocks. No stool examination or culture or other laboratory test was done. The infant was put on half skimmed milk (boiled), but diarrhea

and vomiting continued. On the fourteenth and fifteenth day of life, the infant was again seen by the physician because of watery stools. No cultures or other laboratory work was done. The infant was continued on half skimmed milk (boiled).

On the sixteenth day of life, the infant was readmitted to the hospital because of watery stools and vomiting which had become projectile. The temperature on admission was 98.4°. The infant, who weighed 2164 grams, was cyanotic and dehydrated. Laboratory work on admission revealed a blood chloride content of 117 milliequivalents per liter, blood carbon dioxide content of 8 milli-equivalents per liter, hemoglobin of 19 grams per cent. A throat culture revealed *E. coli*, but a blood culture was sterile. The infant was put in an incubator and started on 200 cc. intravenously of a hydrating solution (one third normal saline and two thirds 5 per cent glucose in water, with an added 12 cc. of 1 molar lactate solution). 200,000 units of penicillin and 25 milligrams of streptomycin were also given intramuscularly. Dark brown material began to drain from the infant's nose, and the infant expired ten and one half hours following admission, at the age of seventeen days. At autopsy, cerebrospinal fluid culture revealed the presence of *E. coli*; stool culture revealed no salmonella or shigella. Autopsy examination revealed the trachea and bronchi to be filled with a light pink frothy material. The lungs were markedly edematous on cut surface. The gastrointestinal tract appeared grossly normal. On microscopic examination, the mucosa of the small intestine was grossly infiltrated with leukocytes, macrophages, and fibroblasts. There was a superficial mucosal ulceration in one area. The lungs on microscopic examination showed the presence of pulmonary edema.

Committee comment.—An infant in the first month of life who has continuous loose stools is apt to have both dehydration and electrolyte imbalance. It is very essential that early intravenous, and not subcutaneous, administration of electrolytes be given. These children in some instances may lose an average of 8 ounces per day which represents far more than just the loss of fluids. The loss of essential electrolytes which should be replaced in the circulation necessitates prompt intravenous therapy.

Case 4.—A thirty-six-year-old mother (four full-term living infants) had a normal pregnancy. Labor began at thirty-nine weeks of pregnancy, and delivery was spontaneous under no anesthesia. The amniotic fluid was stained yellow and the placenta was edematous. The infant weighed five pounds and ten ounces. The child was cyanotic from birth and had a high pitched cry. The respirations were irregular. The physician taking care of the infant found hepatosplenomegaly. Laboratory tests done on the infant at seven hours of age revealed the following: hemoglobin 8.4 grams per cent, red blood cell count 1,950,000 per cubic milliliter, white blood cell count 21,360 per cubic milliliter, normoblast count

70 per 100 white blood cells. The Coomb's test was reported as negative on both the baby and the mother. The infant's Rh typing was CDE and the mother's Rh typing was cDE. At seven hours and twenty minutes of age the baby was given a transfusion of 70 cc. of group 0 Rh negative blood. The infant continued to have spells of cyanosis. Vitamin K, one ampule, and coramine, ¼ cc., was given to the infant. No further laboratory work was done on the baby. The baby expired at fifteen hours of age. Autopsy examination disclosed hepatosplenomegaly, along with 10 cc. of yellow fluid in each pleural cavity. Microscopic examination of the liver and spleen revealed erythroblastosis. The lung alveoli were filled with hemorrhagic fluid which was interpreted by the pathologist to be associated with erythroblastosis. Examination of the brain revealed no evidence of hemorrhage or kernicterus.

Committee comment.—This case illustrates the possible danger of relying upon a single laboratory diagnosis. A negative Coomb's test would certainly be unexpected in this instance. Therefore, the clinician should have confirmed the test by further testing. The new testing procedures which embrace the three factors of big CDE and little cde may explain the discrepancy in some cases.

Summary

The Hennepin County Neonatal Mortality Committee studied all neonatal deaths occurring in infants born in Hennepin County during 1952, 1953, and 1954. This involves 1,012 infants, including thirty-one sets of twins and one set of triplets, born to 988 mothers.

This report briefly reveals some of the findings of the three-year study, providing information on both premature and full-term infants, and presents some of the Committee's resulting opinions. It gives tables and interpretations on the types of delivery and duration of life of the 1,012 infants who died within the first twenty-eight days of life. In this paper the Committee, which conscientiously attempted to determine the primary cause of death in each infant, also gives a breakdown of the causes of death. Included in this breakdown of causes are abnormal pulmonary ventilation, which accounted for 60 per cent of the deaths noted in this study, congenital anomalies, infection, birth trauma, blood dyscrasia, and anoxia.

An analysis of the numbers and percentages of infants autopsied shows a gradual increase from 1952 to 1954. In 1954, autopsies were performed on 62 per cent of the premature and 88 per cent of the full-term deaths. Approximately 7 per cent

NEONATAL DEATHS IN HENNEPIN COUNTY

of the neonatal deaths noted in this study were judged by the Committee to have preventable factors. However, improvement in care may have been possible in an additional 17 per cent of the deaths. Brief case histories are given for four of these deaths, accompanied by a medical opinion on what procedures should have been followed to offset the factors resulting in death.

The Committee wishes to express its appreciation to the many physicians and pathologists who

so kindly co-operated by providing data on their cases and by providing records showing a consistently high percentage of autopsies.

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APPENDIX

TABLE A. BIRTH WEIGHTS
Mortality Study, 1954

Weight	1954		
	No.	Per Cent	
Less than 1000 Gm. (2 lb. 3 oz. or less)	90	30.3	71.7
1000-1499 Gm. (2 lb. 4 oz.-3 lb. 4 oz.)	51	17.0	
1500-1999 Gm. (3 lb. 5 oz.-4 lb. 6 oz.)	35	11.7	
2000-2499 Gm. (4 lb. 7 oz.-5 lb. 7 oz.)	39	13.0	
2500 Gm. and over (5 lb. 8 oz. and over)	85	28.3	28.3
Unknown			
Total	300		100.0

TABLE B. AUTOPSIES BY INFANTS' BIRTH WEIGHT
Mortality Study, 1954

Weight in Grams	Autopsies No./No. 1954 Infants	Autopsies Per Cent
Under 1000	47/90	52.2
1000-1499	26/51	51.0
1500-1999	28/35	80.0
2000-2499	33/39	84.6
2500 & over	75/85	88.2
Total	209/300	69.7

TABLE C. MOTHERS' AGES BY INFANTS' BIRTH WEIGHT
Mortality Study, 1954

Ages of Mothers	Weight of Infant in Grams					Total	Per Cent
	Under 1000	1000-1499	1500-1999	2000-2500	2500 & Over		
19 and under	9	3	3	3	6	24	8.1
20-24	25	19	12	13	17	86	29.1
25-29	25	15	9	6	21	76	25.7
30-34	17	8	5	10	23	63	21.3
35-39	10	3	5	3	15	36	12.1
40 and over	2	1	1	4	0	8	2.7
Not recorded	0	0	0	0	3	3	1.0
Total	88	49	35	39	85	296	100.0

TABLE D. SEROLOGIC TESTS FOR SYPHILIS BY INFANTS' BIRTH WEIGHT
Mortality Study, 1954

	Infants' Weight in Grams				
	Under 1000	1000-1499	1500-1999	2000-2499	2500 & Over
Mother's serologic test positive	0	0	0	0	0
Mother's serologic test negative	35	33	24	27	48
Mother's serologic test not recorded	53	16	11	12	37
Per cent serologic tests determination done	39.8	71.4	68.6	69.2	56.5

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TABLE E. OBSTETRIC COMPLICATIONS BY INFANTS' BIRTH WEIGHT
Mortality Study, 1954

Complication	Weight of Infant in Grams					Total
	Under 1000	1000-1499	1500-1999	2000-2500	2500 & Over	
Abruptio placenta	9	3	4	5	4	25
Antenatal bleeding, cause unknown	28	12	2	4	5	51
Placenta previa	6	3	4	1	1	15
Toxemia of pregnancy	2	3	2	1	2	10
Polyhydramnios	1			3	2	6
Infection	7	3	4	1	4	19
Influenza		(1)	(1)	(1)	(3)	(6)
Vaginal discharge	(2)	(1)	(2)		(1)	(6)
Fever at delivery, cause?	(3)					(3)
Cystitis	(1)					(1)
Active TB		(1)	(1)			(2)
Perirectal abscess	(1)					(1)
Ruptured cerebral aneurism	1					1
Pelvic inadequacy				1	1	2
Diabetes mellitus			2		3	5
Prolapsed cord	2			1		3
Glomerulonephritis		1	2			3
Infraction placenta	1					1
Surgery for bowel obstruction	1		1			2
Automobile accident	1		1			2
Fall on stairs			1			1
Total	59	25	23	17	22	146

TABLE F. TYPES OF DELIVERY BY INFANTS' BIRTH WEIGHT
Mortality Study, 1954

Type of Delivery	Weight of Infant in Grams					Total	Per Cent
	Under 1000	1000-1499	1500-1999	2000-2499	2500 & Over		
Cephalic	47	30	21	28	62	188	62.7
Breech	37	17	9	4	16	83	27.7
Cesarean section	6	4	5	7	7	29	9.6
Total	90	51	35	39	85	300	100.0

TABLE G. RH DETERMINATION BY INFANTS' SPECIFIC BIRTH WEIGHT
Mortality Study, 1954

Rh Status	Weight of Infant in Grams					Total
	Under 1000	1000-1499	1500-1999	2000-2499	2500 & Over	
Mother Rh positive	51	34	18	25	50	178
Mother Rh negative	7	3	5	5	14	34
Mother Rh not recorded	30	12	12	9	21	84
Per cent Rh determinations done	65.9	75.5	65.7	76.9	75.3	71.6

TABLE H. INDICATIONS FOR CESAREAN SECTION BY INFANTS' BIRTH WEIGHT
Mortality Study, 1954

Indication for Cesarean Section	Weight of Infant in Grams					Total
	Under 1000	1000-1499	1500-1999	2000-2499	2500 & Over	
Toxemia	1	1	2	1		5
Placenta previa	3	3	2	1		9
Abruptio placenta			1	2		4
*Contracted pelvis				1	1	2
*Rh incompatibility				2		2
*Diabetes and elevated Rh titre					1	1
*Hydrocephalus of infant (diag. X-ray)					1	1
*Previous intra-uterine death					1	1
Ruptured cerebral aneurism	1					1
*Ruptured uterus first child, elective	1					1
*Transverse pres., prev. C.S.					1	1
Bleeding, cause unknown					1	1
Total	6	4	5	7	7	29

*Elective

NEONATAL DEATHS IN HENNEPIN COUNTY

TABLE I. DURATION OF LIFE BY INFANTS' BIRTH WEIGHT
Mortality Study, 1954

Duration of Life	Weight of Infant in Grams								Total	
	Premature						Full-term			
	Under 1000	1000-1499	1500-1999	2000-2499	Under 2500					
					No.	Per Cent	No.	Per Cent	No.	Per Cent
Under 1 hour	14	4	3	8	29	13.5	15	17.6	44	14.7
1-24 hours	57	26	15	16	114	53.0	30	35.3	144	48.0
25-48 hours	8	8	12	6	34	15.8	14	16.5	48	16.0
2-7 days	11	7	5	7	30	14.0	15	17.6	45	15.0
8-28 days	0	6	0	2	8	3.7	11	13.0	19	6.3
Totals	90	51	35	39	215	100.0	85	100.0	300	100.0

TABLE J. CAUSES OF DEATH BY INFANTS' BIRTH WEIGHT
Mortality Study, 1954

Cause of Death	Weight of Infant in Grams					Total	
	Under 1000	1000-1499	1500-1999	2000-2499	2500 & Over	No.	Per Cent
Abnormal pulmonary ventilation	83	44	22	17	24	190	63.4
Immaturity unqualified	(77)	(38)	(13)	(8)		(136)	(45.4)
Atelectasis	(1)		(1)	(1)	(21)	(24)	(8.0)
Hyaline membrane disease	(5)	(6)	(8)	(8)	(3)	(30)	(10.0)
Congenital anomalies		2	2	13	32	49	16.3
Infection	1	2	2	1	4	10	3.3
Pneumonia	(1)		(2)		(2)	(5)	(1.7)
Septicemia		(2)		(1)		(3)	(1.0)
Omphalitis with meningitis					(1)	(1)	(0.3)
Toxoplasmosis					(1)	(1)	(0.3)
Blood dyscrasia				3	12	15	5.0
Rh incompatibility				(3)	(9)	(12)	(4.0)
ABO incompatibility					(3)	(3)	(1.0)
Birth trauma	4	3	6	2	6	21	7.0
Intracranial hemorrhage	(4)	(3)	(6)	(2)	(5)	(20)	(6.7)
Multiple skull fracture					(1)	(1)	(0.3)
Other	2*		3**	3***	7****	15	5.0
Total	90	51	35	39	85	300	100.0

* 1 each of ascites, seizures unknown cause.

** 1 each of meconium ileus with peritonitis, leukemia, pulmonary hemorrhage unknown cause.

*** 1 each of bilateral atelectasis with pulmonary hemorrhage hydrops—not erythroblastosis, sub-endocardial fibroblastosis.

**** 2 hem. unknown cause, 1 each of meningo-encephalitis with inclusion bodies in brain, adrenal hem. and infarcts, fatty metamorph. liver and kidney, possible Ritters disease, jaundice with ? cause.

PRIMARY MALIGNANCIES OF THE LUNG

(Continued from Page 709)

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Surgical Considerations in Acute Conditions in the Lower Abdomen

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THE DIAGNOSIS and treatment of acute conditions in the lower abdomen must engage the attention of every general practitioner, general surgeon and gynecologist. This is a field in which the physician must rely upon a careful history, a thorough examination and interpretation of the findings. Elaborate and complicated laboratory tests are usually not required.

To be satisfied with the diagnosis of "acute abdomen" robs the endeavor of much of its fascination and interest. One should strive to determine the exact pathologic process which has brought the patient to the physician. In addition to careful examination of the abdomen, the inguinal and femoral rings, the pelvis and the rectum should be examined.

In reviewing 1,267 cases of acute abdominal emergencies personally attended, it was found that 158 (12.47 per cent) were in the upper abdomen and 1,109 (87.53 per cent) were in the lower abdomen. Of the 1,109 cases of acute lower abdominal conditions, there were 727 cases of acute appendicitis.

The classic symptoms of this disease are now well known by both physicians and lay persons. It is the atypical case which may escape diagnosis and proper treatment, which is prompt surgical removal of the appendix. Localized tenderness is the most valuable single sign, and it may be elicited by rectal examination when abdominal palpation reveals no tenderness. Diarrhea is not a common symptom of appendicitis, but its presence does not exclude appendicitis, and the premature diagnosis of gastroenteritis may lead to disaster. The differential leukocyte count, which shows a shift to the left in nearly all cases of acute appendicitis, is a more valuable aid than the total leukocyte count.

Mesenteric lymphadenitis is the condition most frequently confused with acute appendicitis. It is an acute or subacute abdominal condition deserving special consideration in its own right. It occurs in young children and is characterized by the presence of large and numerous lymph nodes

in the mesentery and fluid in the peritoneal cavity. The symptoms are similar to those of appendicitis although usually not as severe; there is frequently a history of one or more mild attacks of abdominal pain, sometimes accompanied by nausea and vomiting. The point of maximum abdominal tenderness is variable. Tenderness on rectal examination is a nearly constant finding. In only about half of the cases does the differential leukocyte count show a shift to the left.

It has been said that the differential diagnosis of mesenteric lymphadenitis is purely academic. Appendectomy is the recommended treatment. In nearly all cases, symptoms are relieved and a cure is effected.

Intestinal obstruction is the second most common cause of acute symptoms in the lower abdomen, represented by 12.17 per cent of the cases in this series, nearly all of which involved the small bowel. Only occasionally does an obstruction of the large bowel require emergency treatment. As is well known, intestinal obstruction is characterized by intermittent crampy pain which may occur at regular intervals, nausea, vomiting, abdominal distention, increased intestinal sounds and inability to pass gas by rectum.

It is to be noted that seventy-eight cases, or more than half, were the result of hernias, a clear indication that examination of the femoral, inguinal and umbilical rings and incision scars is most important. The history of a previous abdominal operation and the presence of an incision scar should remind the examiner of the possibility of obstruction produced by adhesions or an adhesive band. Volvulus and intussusception are ordinarily accompanied by intense pain, sweating and shock.

The Miller-Abbott tube, which is my choice of the long tubes, can be employed satisfactorily in some inflammatory conditions, in the persistent ileus which occasionally follows laparotomy, and in selected cases of obstruction due to adhesions. When reliance is placed on intubation alone, one must be positive that the integrity of the bowel

ACUTE CONDITIONS IN THE LOWER ABDOMEN—NEEL

TABLE I. LOCATION OF PATHOLOGIC PROCESS IN 1267 CONSECUTIVE CASES OF "ACUTE ABDOMEN"

	Number	Per Cent
Upper abdomen	158	12.47
Lower abdomen	1109	87.53
Total	1267	100.

is not in jeopardy. Most patients with obstruction of the small bowel should be operated on promptly, however, after proper preparation, and the obstruction relieved by whatever surgical procedure is necessary.

The frequency with which diverticulitis of the colon is encountered is said to be increasing. In only a small percentage of cases is emergency treatment necessary. The perforation of a diverticulum may produce a localized or generalized peritonitis. The mesosigmoid may be long and the sigmoid may be on the right side of the abdomen. Operative treatment consists of either obstructive resection, proximal colostomy or drainage of the abscess.

In female patients, there are additional considerations in diagnosing the acute abdomen. Several years ago Swendson stated that "the cause of an acute lower abdominal crisis in a woman of menstrual age often cannot be determined without doing an exploratory laparotomy." As mentioned previously, every effort should be made to arrive at a correct diagnosis.

Ectopic pregnancy is the most frequently encountered acute condition in the female pelvis. Low abdominal pain, which may be fairly severe, is the most nearly constant symptom. The menstrual period may be delayed and, when bleeding ensues, it may be spotty, irregular or persistent. If there has been bleeding into the peritoneal cavity, the patient may complain of pain in the left shoulder. Tenderness is found on palpation of the lower abdomen and on movement of the cervix during pelvic examination. Some patients with ectopic pregnancy, when first seen, are in shock and present the signs of hemoperitoneum. Laparotomy and salpingectomy, with blood replacement as necessary, are indicated as soon as the diagnosis is made.

The symptoms and signs of bleeding follicle cysts simulate those of appendicitis, and occur at about the middle of the menstrual cycle and in young women. Although mild, they may recur time after time so that many of these patients see the

TABLE II. ACUTE PROCESSES IN LOWER ABDOMEN

	Number	Per Cent
Acute appendicitis	727	65.5
Mesenteric lymphadenitis	99	8.02
Gynecologic conditions	99	8.02
Intestinal obstruction	135	12.17
Diverticulitis of sigmoid	11	.91
Diseases of Meckel's diverticulum	5	.45
All others	33	2.97
Total	1109	

TABLE III. ANALYSIS OF TYPES AND CAUSATIVE FACTORS IN ACUTE INTESTINAL OBSTRUCTION

Cause	Number Cases
Inguinal hernia	46
Adhesions or adhesive band	33
Femoral hernia	13
Umbilical hernia	12
Incisional hernia	7
Intussusception	6
Volvulus-small bowel	5
Obturation	4
Tumor (carcinoma, carcinosarcoma, lymphosarcoma)	4
Volvulus of cecum	3
Internal hernia	2
Total	135

physician frequently. Operation should be avoided, if possible, but at times much blood is found in the pelvis; on a few occasions it has been necessary to place fine sutures in the ovary to control the bleeding.

Ovarian cysts may rupture spontaneously, producing sudden severe lower abdominal pain. Intraperitoneal hemorrhage may be profuse, accompanied by shock, pallor, and a distended and tender abdomen. On pelvic examination, if tenderness is not too pronounced to permit a satisfactory examination, the mass can be felt.

Ovarian cysts and tumors, leiomyomas of the uterus, the uterine adnexae and hydatids of Morgagni are subject to torsion on their pedicles. Except in the case of hydatids, the symptoms produced by the phenomenon are rather severe and dramatic. The intense crampy pain, backache, nausea, vomiting, tenderness, the presence of a palpable pelvic or lower abdominal mass should clarify the diagnosis. In one patient with torsion of an ovarian tumor, the uterus also had been twisted 180 degrees.

Acute salpingitis of gonorrheal origin is seen less frequently than formerly. Acute pelvic infection is characterized by chills, fever, vaginal discharge and extreme tenderness on low abdominal and pelvic palpation. Response to anti-

ACUTE CONDITIONS IN THE LOWER ABDOMEN—NEEL

TABLE IV. GYNECOLOGIC CONDITIONS RESPONSIBLE FOR DIAGNOSIS OF "ACUTE LOWER ABDOMEN"

Condition	Number Cases
Ectopic pregnancy	29
Bleeding follicle cyst	20
Ruptured ovarian cyst	11
Torsion of ovarian cyst	10
Torsion of ovarian tumor	2
Torsion leiomyoma of uterus	2
Torsion uterine adnexae	3
Torsion hydatid of morgagni	4
Salpingo-oophoritis	9
Endometriosis	5
Ruptured uterus	2
Cervical and uterine tears	2
Total	99

biotics is usually good. Surgery in the acute phase is not indicated.

Attention should be drawn to the fact that retroperitoneal hemorrhage due to anticoagulant therapy produces symptoms and signs of an abdominal emergency. Vigorous medical treatment is necessary to save the patient, who may be in profound shock. Surgical interference is of no avail.

Summary

The diagnosis of acute abdominal conditions is a problem for nearly every physician. This is a field in which the examiner must depend on his own senses and not rely too greatly on laboratory assistance. In the lower abdomen acute appendicitis, intestinal obstruction, mesenteric lymphadenitis and gynecologic conditions account for more than 90 per cent of the cases.

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TABLE V. MISCELLANEOUS CONDITIONS FOUND IN LOWER "ACUTE ABDOMEN"

Condition	Number Cases
Retroperitoneal hemorrhage	5
Torsion of epiploic appendage	5
Diseases of Mesentery (thrombosis, lymphangioma, lipomatosis)	4
Perforation by ingested foreign body	3
Enterocolitis	3
Regional ileitis	2
Hemorrhage into rectus muscle	2
Perforation sigmoid	2
Diverticulitis of cecum	2
Carcinoma of cecum with appendicitis	2
Diverticulitis of ileum	1
Laceration of mesosigmoid	1
Laceration of omentum	1
Total	33

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AMERICAN HEARING SOCIETY SURVEYS SERVICES AT LOCAL LEVEL

Hard of hearing children and adults across the country will benefit from the American Hearing Society's current survey of services offered by its member organizations, according to the agency's Executive Director, Crayton Walker.

Standards established by the society are aimed at improving and expanding local hearing programs, and securing additional chapters, as well as raising the standards of national services to the hearing handicapped.

Special effort will be made to improve the hearing aid evaluation and consultation services, which are an

important part of the program in many local hearing societies.

"Because of the growing demand for guidance in selection and use of a hearing aid," said Mr. Walker, "we are encouraging all of our member agencies to include such service, and to work more closely with hearing aid dealers in the respective communities."

On its national roster, the American Hearing Society now carries forty-three member agencies with professional staff, and fifty-three affiliates having volunteer workers only. Many of the member agencies, located in metropolitan areas, are included in the United Funds or Community Chests.

Continuation Studies

Counseling Parents of Mentally Retarded Children

HARRIET E. BLODGETT, Ph.D.

Minneapolis, Minnesota

THE AREA of counseling with the parents of mentally retarded children is one of great complexity. Mental retardation is, after all, a descriptive term which applies to a wide range of intellectual ability, includes a tremendous variety of behavioral characteristics and adjustments, and stems from a large number of possible causes. Since the mentally retarded child is found in families of all sorts, everywhere, in counseling we are dealing with a wide range of family situations and of adaptability of parents and siblings to the retarded child. What determines the problems the parents may face in living with their retarded child is affected more by the behavioral characteristics of the child and the flexibility and adaptability of the parents than by the child's intellectual ability.

Giving parents adequate understanding of the mentally retarded child should be considered as a series of interpretations, rather than just one. This series needs to include both the contributions of psychological and developmental measures, as assessments of the child's ability level, and pertinent medical studies, including neurological and sensory evaluations, important in ascertaining the underlying causes of the child's deficiency, evaluating the part played by sensory defects, and, increasingly important with the newer advances in medical treatment, in determining medical treatment which may contribute to the manageability of the child. Describing the child's ability level, as measured by psychological instruments, is a process facilitated by a basic policy of honesty and frankness, with information being presented sympathetically but factually. Parents very often are themselves able to participate in this interpretive

process, and such participation is most helpful to the professional person involved. What the parents themselves say in describing the child can be used by the examiner in discussion. Often it is helpful to ask the mother to demonstrate how she works with the child, and then to help her interpret the responses she has elicited. Many times parents are amazingly accurate in estimating the child's ability level, if they have come to feel comfortable and nondefensive in the interview situation. This is especially likely to be true if there are other children in the family so the parents have had daily standards for comparison.

Interpreting the child's present ability level, however, is not enough. The meaning for the child's future is the more significant thing. Many parents willing to accept the fact that the child is, as of now, "retarded" have not considered the implications this has for his future, and are convinced that he will later "catch up." Parents often can comprehend and understand the present level of the child, but are unable to project this into the future. Prediction is much more mysterious than measuring the child's present ability; parents can see the immediate situation, and can even accept the findings, but have not yet thought, or are not yet able to think, in terms of a permanent mental defect. Explanation of the ways in which we know human development to be consistently patterned is helpful. Often the use of a mental growth chart covering the developmental years, showing the child's present mental age performance, and then projecting this into the future to show the expected degree of later handicap, will make the process more clear. Many parents take several years to become convinced of the permanence of the defect and to realize what its later significance will be to the child; one function of adequate counseling is to attempt to make this information meaningful in advance so that parents may be spared the continuing disappointments and frustrations

Dr. Blodgett is Program Director, The Sheltering Arms, A Day School and Research Program for Mentally Retarded Children.

Presented at the University of Minnesota center for continuation study institute on "The Exceptional Child in Minnesota," October 2, 1956.

of not having their aspirations for the child's future development fulfilled.

With young children of preschool age, re-examinations are part of the process of interpretation, and contribute to a continuing process of step-by-step planning on the part of the parents. Again, it is important not to give the parents false hopes; a child in the severely retarded group can nearly always be identified with good accuracy, although one might not want to "label" him with a permanent IQ score at an early age. Less severe degrees of retardation may call for more caution in interpretation, but letting the parents in on the fact that he is somewhat retarded, and that this is probably a permanent handicap, is the wise course. Parents accept the recommendation for a re-evaluation well when it is explained as offering opportunity for a further kind of comparison. The first test tells us where he is now; the second one tells us where he is then, plus permitting a study of his rate of development in the interval between the two measurements. Even though long-range prediction should not go beyond knowledge, early interpretations to parents are of extreme importance not only in helping form their attitudes toward the child's future, but also in helping to modify their attitudes toward him and their expectations of him at the present. Many emotional and behavioral problems in retarded children are the result of unrealistic demands made by their parents, often in an attempt to "force" the child into normal development.

In the step-by-step planning, discussion of commitment to state guardianship as mentally defective, as a protective measure for the child, should come relatively early. Parents need time to think about this, quite apart from the possibility of the child's later need for institutional care. They need to know that commitment is not the same thing as placement in an institution; they need to learn to think in terms of the agencies and consultative services which will be available to them in making choices and decisions.

There is no formula for knowing how much information, at what pace, should be given to individual parents. Experience indicates that some parents can absorb a great deal of information, while others need to progress at a much slower rate. In general, if the first discussion covers the facts of the child's retardation, begins the expla-

nation of commitment, and gives a little idea of the implications of the retardation for the child's future, it is probably enough. Later sessions should be arranged as problems arise, provided the parents feel free to seek further help at critical moments. Some things which can be suggested in the course of several discussions with the parents should include: the child's need for constructive things to do; his need for close supervision; his need to acquire physical independence, good basic habits, and good social habits; the possibility that later on he might be unhappy at home or in the community because of his inability to compete or to find a niche for himself; the need of the family to consider other children, and themselves; ways in which others have been mutually helpful (i.e., local groups of the Minnesota Association for Retarded Children); ways of handling specific problems of behavior; and, all through the processes of counseling, the fact that there is no one "right" solution; that each family faces different constellations of problems.

Parents show many reactions to learning that their child is mentally retarded. Some parents reject the diagnosis, and go home to protect and overprotect the child. Some who reject the diagnosis respond by a determination to "make the child be normal;" this is likely to produce additional problems of adjustment for the child. Some accept the diagnosis, but react to this with a rejecting attitude toward the child. Others, accepting of the fact of the retardation, try to overprotect the child, feeling that this will conceal his defect. Many parents, however, are able to accept the diagnosis realistically and go home to handle their situation realistically. Differences of opinion between parents pave the way for increasing conflicts. Since the accepting parent is likely to seek more information, and the non-accepting parent does not, the gap between them continues to widen and the problems may multiply. Other children may suffer through parental unequal division of time, attention, and interest; the normal child may be expected to assume too much responsibility, or may have too many limitations put on his own activities. Perhaps he is expected to compensate for the presence of the retarded child, and achieve twice as much. Since children take attitudinal cues from their parents, confusion in the parents is apt to be communi-

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Symptoms and Signs of Heart Disease

Clinical Approach to the Problem

ARTHUR C. KERKHOF, M.D.

Minneapolis, Minnesota

THE MOST common symptoms associated with heart disease are: pain, dyspnea, edema, tachycardias, arrhythmias and syncope.

Pain of cardiac disease may be of four types: anginal, mitral, pericardial, and pain of infarction. Anginal pain is usually substernal, radiating to one or both arms but may also radiate to the neck. It usually is produced by exertion or excitement and is relieved by rest very shortly. It is immediately relieved by nitroglycerin used under the tongue. Mitral pain usually occurs after exertion. It is located near the apex, and it may remain for some time. It does not radiate and, as a rule, it is not relieved by nitroglycerin. Pericarditis produces retrosternal pain of a rather constant type. There is no radiation as a rule, and it is not relieved by nitroglycerin. The pain of myocardial infarction is similar in locations and radiation to anginal pain. It is not as a rule brought on by exertion, nor is it relieved by rest. It may last for hours, is more severe than anginal pain and is not relieved by nitroglycerin.

The pains associated with heart disease must be differentiated from those produced by hiatus hernia, chest wall difficulties, pleurisy, cervical outlet irritation, so-called "heart burn" and esophageal spasm, pulmonary embolism and functional disorders. Although a gastrointestinal x-ray is not always successful in finding a hiatus hernia most of these lesions will be discovered by careful examination with that method. Chest wall difficulties as a rule can be differentiated by the fact that there is definite tenderness to pressure, whereas heart pain itself is not produced by pressure on the chest wall. Pleurisy will have the typical pain related to breathing and is relieved by holding the breath. It usually, therefore, is differentiated both by history and by reason of the friction rub which may or may not always be heard. Irritation

of the cervical nerve rootlets in the cervical spine is not an uncommon condition. Examination for this bony difficulty can be made by x-ray, and proper x-rays may show definite impingement upon nerve rootlets. Although esophageal spasm and "heart burn" produce very definite retrosternal pain at times, they are not as a rule produced by exertion. They are usually relieved by belching and antispasmodics will usually also give relief. Pulmonary embolism can cause pain but usually is differentiated by the fact that there is a cause for a pulmonary embolism in the sense of some thrombotic episode in a vein or by reason of the fact that the patient coughs up blood with the episode. Functional chest pain, of course, is the most common chest pain of all. It would appear that over 50 per cent of all individuals who complain of pain in the chest have that pain on a functional basis and not on the basis of organic disease. Careful history plus the absence of organic findings will lead one to make such a diagnosis.

Dyspnea of cardiac origin is usually one of two types; it can occur on exertion and may be relieved by rest. It may occur during the night as a result of a drop in blood pressure or an exciting dream state. It may also take the form of orthopnea. Cardiac dyspnea must be differentiated from the dyspnea due to improper breathing habits, hysteria, asthma, emphysema, acidosis and air hunger due to lack of oxygen in the atmosphere or lack of oxygen carrying capacity.

Edema of cardiac origin, a sign of right heart failure, is usually dependent. It is almost always associated with an increased venous pressure, except in those cases where the patient is beginning to recover and the edema has not entirely disappeared. Cardiac edema must be differentiated from that due to varicosities and that due to lowered blood albumin, as in nephritis and starvation states.

Synopsis of remarks made at Continuation Course in Cardiovascular Disease, University of Minnesota, March 19, 1956.

Tachycardias and *Arrhythmias* are of course all cardiac in that the heart is involved, but they do not necessarily indicate cardiac distress. Premature beats, simple tachycardia, paroxysmal tachycardia and paroxysmal auricular fibrillation are usually nonpathologic. Many of these can be diagnosed by a good history and very minimal examination.

Syncope is usually due to a marked slowing of the heart rate either by a vagus effect, as in fainting, or by a complete heart block with a very slow ventricular rate. Differentiation between these is simple.

The signs of heart disease are found on examination. Although dyspnea, obviously, as a rule, is a symptom, at times the patient does not realize this dyspnea, but it can be seen definitely on inspection. Edema, of course, is also a sign in the sense that it is easily recognized by inspection and palpation. Cyanosis may be a sign of heart disease and, certainly, is a sign of decreased oxygenation of the arterial blood and, as a rule, will be seen on inspection. Palpation will also reveal the presence of thrills which may be a definite

sign of heart disease, and will reveal enlargement of the liver if that is present. Auscultation of the heart for murmurs is important, as is the auscultation of the lungs for rales which could indicate the presence of lung edema. Enlargement of the heart is a very important sign of heart disease. Any cardiac enlargement greater than 10 per cent over the Clark-Ungerleider tables must be considered abnormal. The shape of the heart is also determined by x-ray. Any abnormal shapes, such as occur in mitral disease or left ventricular heart disease, can easily be determined by that method. *Arrhythmias* may frequently be determined by auscultation or palpation of the pulse at the wrist but in complicated cases an electrocardiogram becomes necessary. The electrocardiogram also will determine the presence or absence of myocardial abnormalities. Blood pressure determination is of very definite value, although at present there is a very strong indication that our previous upper limits of normal blood pressures were probably lower than they needed to be. It must be remembered that we now are accepting values considerably higher than those previously accepted as normal.

ESTABLISHMENT OF A BLOOD VESSEL BANK

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Certainly, special precautionary care to assure aseptic technique during the sterilization of the graft is an absolute necessity and should therefore be entrusted only to one thoroughly familiar with aseptic procedures. The cultures taken to check the sterility of the graft give one assurance of sterility only at the time the culture was taken. A later break in technique can invalidate this safeguard and cost the life of the recipient of the graft. This is one more area of surgery with no room for error.

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Editorials

JOHN F. BRIGGS, M.D.
ARTHUR H. WELLS, M.D.
HENRY G. MOEHRING, M.D.

WILLIAM H. FELDMAN

The tuberculosis-control program in America never has been an exclusive battleground for physicians only. Rather, every dedicated worker has always been welcomed, and the diverse composition of the antituberculosis army has been one of its greatest strengths. No better example of this can be found than the career of William H. Feldman, D.V.M., M.S., D.Sc. (honoris causa), professor of comparative pathology in the Mayo Foundation, Graduate School, University of Minnesota, who was cited by the Minnesota State Medical Association on May 14, 1957, for "Distinguished Service to Medicine."

Trained in veterinary medicine, Dr. Feldman soon became interested in the problem of tuberculosis in animals, and began his work in this field while he was a member of the faculty of Colorado Agricultural College. When he joined the staff of the Institute of Experimental Medicine of the Mayo Foundation in 1927, he concentrated on the study of naturally acquired and experimentally induced tuberculosis in animals. His experience in this field led to the pioneer work in the chemotherapy of experimental tuberculosis which was carried out with his colleagues, Dr. Frank C. Mann and Dr. H. Corwin Hinshaw. In due course, the effect of streptomycin on tuberculosis in guinea pigs was demonstrated, and this led to the clinical studies which have revolutionized the treatment of this disease.

Many honors have been bestowed upon Dr. Feldman for his work. In 1946, he delivered the Harben Lectures at the Royal Institute of Public Health in London. In that same year, he was presented with the Pasteur Medal by the Pasteur Institute in Paris, and with the Alvarenga Prize by the College of Physicians of Philadelphia. The Mississippi Valley Conference on Tuberculosis awarded him the Hoyt Dearholt Medal in 1953, and the National Tuberculosis Association named him the Trudeau Medallist for 1955. The most recent honor was the Distinguished Service Medal of the American College of Chest Physicians, given to Dr. Feldman at the 1957 meeting of the college.

These many honors have been richly deserved by this devoted scientist, but those who know Dr. Feldman best realize that his greatest reward has been the inestimable contribution which chemotherapy has made to the control of tuberculosis throughout the world.

DAVID T. CARR, M.D.

SPECIAL PILOT PROJECT IN MENTAL RETARDATION

A pilot project to discover what a multidisciplinary team approach, consisting of a pediatrician, public health nurse, welfare worker, social worker, psychologist, and any indicated consultants, will reveal as to the whereabouts as well as the physical, emotional, and social needs of mentally retarded children in rural counties has been undertaken by the Minnesota Department of Health in cooperation with the Minnesota Department of Welfare. The study is one of a number being financed by special grants from the U. S. Children's Bureau to state health departments. It has been reviewed by the Council of the Minnesota State Medical Association and is receiving their active cooperation.

The project is limited to four counties in west central Minnesota—Becker, Clay, Otter Tail and Wilkin, with headquarters at Fergus Falls, in close connection with the District Health Office and the state mental hospital. The staff will consist of a medical director, pediatrician, public health nurse, welfare community worker, social worker and a psychologist. The staff will work closely with local physicians, county welfare workers, teachers, ministers, public health nurses and parents. It earnestly requests the active interest and co-operation of the local medical societies, school authorities, welfare agencies, and other interested official and voluntary groups. The study will continue for four years.

This special project will serve a dual purpose: (1) to determine what can be done in rural counties as a part of the community responsibility to improve local services for the mentally retarded and to minimize the necessity for institutional

care; (2) to stimulate and foster the development and operation of community services for retarded children and their families in rural areas throughout the state. The first step will be to locate all retarded children in the four counties in the study; next, to secure adequate diagnoses and treatment through a medical-psychological-social work approach; and finally, a program of group socialization through day care centers, camping groups, scout troops and other indicated activities and facilities within the capabilities of these children. Some, who are trainable only, may receive individual services within their limits; the educable group will be prepared for the classes for exceptional children made possible by the last legislature.

The state-wide advisory committee for the project includes: Dr. Maynard Reynolds, Dean M. Schweickhard, Dr. Harriet Blodgett, Frank M. Rarig, Jr., Dr. E. J. Engberg, Dr. George Logan, Roberta Rindfleisch, Alberta Wilson, Mrs. F. C. Adair, and Dr. George Williams. Dr. A. B. Rosenfield, director of the division of special services of the Minnesota Department of Health and Dr. Dale C. Cameron, director of the division of medical services of the Minnesota Department of Welfare are ex-officio members.

A. B. ROSENFELD, M.D.

Minnesota Department of Health

d-TUBOCURARINE IN MAN*

The clinical use of muscle relaxants has increased many fold during the past decade and marks one of the great advances in the field of anesthesiology. At the same time, there exists a paucity of experimental study both on the action and of the fate of these compounds in the body.

A study of the effects following the intravenous injection of large amounts of d-Tubocurarine was carried out on seven unanesthetized volunteer subjects. Biochemical analyses of blood plasma levels of curare were measured with the aid of a newly developed ultra-violet spectrophotometric technique.

The elimination of curare by the body with the passage of time revealed that 25 per cent of the originally intravenously injected dose (0.1 mg. curare per pound of body weight) was still present in the plasma one hour after its administration.

*Abstract of a thesis presented at the Minnesota Academy of Medicine, February 13, 1957.

This plasma level of over 1 gamma per cubic centimeter was not discernible by clinical measurement of vital capacity which had already returned to normal levels. This residual curare level constitutes a hidden danger to the apparently recovered post anesthetic patient. The effects of narcotics given for postoperative pain relief added to the residual plasma curare may combine to push the patient into severe respiratory depression.

A study of the overall respiratory depressant action of curare showed close correlation between plasma concentrations of curare and reduction of measured vital capacity. Levels of curare above 4 gamma per cubic centimeter of plasma produced severe degrees of respiratory depression. No significant hemodynamic changes could be demonstrated following the intravenous injection of curare in the unanesthetized subjects.

The action of anti-curare compounds on the plasma levels of curare showed that both edrophonium (Tensilon) and neostigmine produced a temporary reduction in plasma curare concentrations and a concomitant improvement in measured vital capacity. The action of the former compound is outlasted by the residual curare effects.

ELLIS N. COHEN, M.D.

RESEARCH AND THE MINNESOTA HEART ASSOCIATION

Few volunteer health organizations can look back on the first decade of their operations with as much justified satisfaction as can the Minnesota Heart Association. In dollars and cents terms, it has grown from an annual income of \$30,000 to over \$500,000. Its annual investment in research on the causes, prevention and treatment of cardiovascular diseases has grown from \$5,000 in 1949 to \$317,732 in 1957. Its contribution to professional and lay education in matters pertaining to the circulatory system in health and disease has grown proportionately. A little more than 50 per cent of the two and a quarter millions raised has gone into research and the remainder aside from organizational expenses can be credited to specific educational projects and community services. Even the organizational and fund-raising activities are largely educational in nature and cannot be ignored in the total impact of the organization upon the community. For example, it is a virtual certainty that community-

vide support for U. S. Public Health Service appropriations for cardiovascular and other medical research has been greater because of the educational role of the Heart Association.

This is a point I should like to develop further. Medicine today is in the process of great ferment. The twentieth century has witnessed the greatest change in the art of healing and of disease prevention that has ever occurred. More progress toward solution of health problems has occurred in the last hundred years than in the whole of the prior ten thousand years, the approximate span of recorded human history. The last half of the nineteenth century saw the establishment of the germ theory of epidemic and contagious diseases. Sanitation and related measures, including artificial immunization, as for smallpox, began the process of wiping out the epidemic scourges of mankind. In the nineteenth century, too, the developments in anesthesia and aseptic surgery set the stage for the surgical advances of later years. The rise of scientific pathologic anatomy also played a major part in making medical practice the art of applying science to disease.

The twentieth century has seen the application of physics and chemistry to health problems in a major way. Mention of the x-ray, radium emanation, electrocardiography, electroencephalography will indicate some of the roles of physics. Mention of vitamins, metabolic diseases, endocrinology, chemotherapy, antibiotics will indicate the range of applications of chemistry.

These developments, which have been occurring at an ever accelerating pace, have not been due to accidents in any true sense. They have occurred because an increasing number of persons of high intelligence and great native curiosity have devoted their lives to searching out the secrets of nature. The twentieth century is an age of science, in medicine as in technology, because Society has begun to realize that scientific research is the only way we know to progress in knowledge about how to control the forces of nature in the interest of human welfare.

This is where the Minnesota Heart Association comes into the situation. Its emphasis on the crucial role of research in the solution of the human problems of heart and vascular diseases has played and is playing a major role in educating the people of Minnesota with regard to the practicality of the impractical. All basic research is impractical. It is useless in the eyes of all ex-

cept those who see that knowledge is never ultimately useless.

A great change has occurred in recent years in public attitude toward the support and encouragement of scientific research. The public has accepted the thesis that research is sufficiently likely to be able to solve important problems, in many fields but particularly in medicine, so that investment in it is the prudent thing to do.

In the Minnesota Heart Research Program, we have seen such support pay off. The Minnesota Heart Association is in no small measure responsible for the development of open-heart surgery. It has aided numerous investigators in studies of the fundamental and applied problems in this field. It has supported a half dozen separate studies of the role of fat and steroid metabolism in relation to the state of health or disease of blood vessels. It has supported studies on the most intimate chemistry and structure of heart muscle. It has supported work aimed at elucidating the mechanisms of circulatory shock. It has aided in studies of transport of materials across membranes. It has assisted in studying the role of heredity in heart disease. During the current year it is assisting sixty-three separate research projects on problems ranging from electron microscopy and enzyme chemistry to clinical applications of physiology, chemistry and physics to diagnostic and treatment problems. For the coming year, your Research Allocations Committee has recommended support of forty-four such projects and four research fellowships. The work will be done in five separate institutions.

The first ten years of the Minnesota Heart Association have coincided with and have been in no small way responsible for the great upsurge in cardiovascular research in the State of Minnesota. As a medical scientist I want to pay my tribute to the intelligent public spiritedness of the many lay men and women who have made this development possible. Especially, I want to salute the Minnesota Association of Life Underwriters for their tireless efforts. I am sure that not only my medical colleagues, but that every person in the community who knows by personal experience or close contact with heart disease what the human stakes are will be grateful that the staff and the members of this corporation are moving forward for even more fruitful investment in research in the next decade.

MAURICE B. VISSCHER, M.D.

CONFESSIONS OF A HOBBYIST

Photography

Some time about 1900, I started taking pictures with a big, clumsy "Hawkeye" box camera and dry plates. The 4 x 5 Stanley plates cost 49 cents a dozen, and a boy had to save up some time for a box of those. Then, except for some snapshotting of the drugstore variety, there was no photography until the late 30's, when Mrs. Briggs gave me a 35 mm. Retina camera for my birthday. That started it again. The Retina was superseded by a Leica, bought in the free port of Curaçao, in the West Indies, and I started on a career of developing and enlarging. I became so enthusiastic that I got bad metal poisoning on my fingers from the developer, and learned the hard way to use tongs. I still use tongs for prints, but I find that for films a hand lotion containing silicone is adequate protection.

35mm. photography is wonderful for making a family record of children. One can shoot a whole roll without pain to the budget, and black-and-white prints, if properly processed, are permanent. This is not true of color. Nobody ever made a permanent aniline dye, and even the best transparencies begin to fade after ten or twelve years. The new Tri-X film is so fast that one can snap and snap indoors. Last Christmas, I shot a whole roll as children and grandchildren were opening their presents, and there were enough good ones to make a delightful record of the occasion.

While not so permanent, color transparencies, to be projected on a screen, are charming. At this point, I conceived the idea of taking closeups of wild-flowers in their natural habitat, which is much more satisfactory than making a pressed and dried herbarium. This, in turn, led to making dye-transfer color prints of the best of the 1,100 color slides that we now have. Flower photography outdoors, close up, is very difficult. The light is never right. Everything is bathed with invisible green light from surrounding vegetation, and because color film is slow, and closeups require longer exposures, one is frustrated by the fact that the things don't stand still. The exposure, too, must be very accurate, or the colors are not right. People are very lenient about black-and-white pictures, but they will look at a color shot on which you have labored and sweated and say,

"Yes, but was it really as blue as that?" I now take extreme closeups indoors, with controlled artificial light. Some tiny, inconspicuous flowers, taken so that one bloom fills the whole frame, enlarge into gorgeous things. The business of making color prints from these transparencies is more than enough for another chapter.

JOHN DEQ. BRIGGS

THE STEEL ENGRAVED BOOKPLATE

In the foregoing articles in this series, the antiquity of the bookplate was outlined, the customs of collecting and exhibiting, the famous depositories, the size and material, and two methods of making the plates and prints.

As for the steel engraving, the cost depends on the intricacy of the design. Because all cutting must be done by hand, plenty of time must be allowed for this sort of engraving, perhaps two months. Each order taken by an engraver of steel must take its turn. Moreover, because this art is such a tax on nerves and eye, the steel engraver must be allowed to lay one client's work aside from time to time in order to concentrate on another quite different. He must cut all lettering backward and the entire design in the same way, and all detail must be perfectly rendered if he is to satisfy his client and himself as an artisan.

In preparing a drawing for a steel engraving, the black and white original must be made exactly the same size as the finished steel engraving is to be, rather than four times as large as in the case of the zinc etching or the copper plate. Furthermore, the drawing must be rendered in precise detail, as the engraver of the steel plate will copy it exactly as he finds it. The method of printing from this plate is the same as from the copper plate—by hand. The cost at present is approximately \$15.00 a hundred, including stock which is usually a Japanese parchment. Shidzuoka vellum is the kind often used. The cost of cutting the plate is the chief item. It will range from \$100.00 to \$250.00.

In choosing the non-gummed papers, one must merely remember that the back of each print will have to be pasted separately at the time they are put into the books. This is a long piece of work, but it can be done by using newspaper squares on which to lay the prints, face down. The newspapers are cut into pieces about the

ze of one's hand and each piece is discarded immediately after using. In this way, the paste from the edges of the preceding print will not be transferred to the face of the next one. The books are left open on the floor for several hours after entering the prints, so that the first few leaves will not become damp.

Work will go faster if one person pastes and another puts into place. One must be sure that the prints are pasted to the very edges, particularly the corners, and that the entire back surface is covered with the paste. The prints are placed absolutely straight. They do not go at center of the fly-leaf but at center of the inside of the stiff cover. The back of the finger-nail will help a stubborn corner to lie flat and will not injure any paper. There is a "Non-warp Paste" on the market which is particularly effective for this type of pasting. It can be bought by the pint at \$1.35, or by the quart at \$2.00, and will keep fresh in the ice-box for months. This is made by the B. H. Fuller Company of Saint Paul. It is in clear, round, glass jars with a screw top. As this company makes many kinds of glues and pastes, the description is given in full. To go with this paste, an artist's flat, half-inch brush with white bristles, procurable at 40 cents, will serve very well by cutting off half the handle.

CLEORA WHEELER

Designer and Illuminator

CALENDAR HISTORY

Although Brown & Bigelow has ventured into all types of advertising specialties, it still remains the foremost calendar maker in the world, turning out 60 million calendars a year to make this item still its No. 1 product.

In its first year of operation, 1896, this company had a total business of \$13,000. By way of comparison, the same firm in 1956 grossed more than \$55 million. Its greatest growth has been under President Charles A. Ward who rose to head the firm in 1933 after starting eight years before as a factory bench hand.

While most of us are familiar with the conventional calendar block containing the months, it was only after 1900 that this type came into use.

Since then, calendars have branched out into

all types and are made of various materials. Metal and plastic calendars in addition to paper products are turned out by the hundreds of thousands by Brown & Bigelow. Calendars are fashioned for the home and even for various rooms in the home. They are made for office, for desk, for wall and for personal use.

For the housewife, Brown & Bigelow has developed the pocket calendar. Here in handy little pouches can be kept recipes, grocery slips and other household records. For the farmer, too, the pocket calendar comes in handy as a convenient place to file away his stock and crop records and other farm information to keep him posted on his operation.

Another type which is a household favorite is a color-picture, multiple-sheet calendar with handy household hints and recipes. The religious calendar—Catholic, Protestant or Jewish—was developed by Brown & Bigelow. Varied types of personal calendars for billfolds, desk or purse are also manufactured in the constant search for calendars which emphasize utility.

These specialized calendars are in addition to the many common hanging calendars which feature the works of the world's great artists both in oil and water color. Colored photograph calendars feature all types of subjects.

There are pictures for the mother, for the outdoor enthusiast, the lover of flowers, dogs, children—all types of pictures which will both enhance the calendar and be a "stopper" for a customer, in the Brown & Bigelow line.

In addition, Brown & Bigelow turns out thousands of tailor-made jobs for many of America's largest railroads and industries. The Great Northern, Burlington, Monon, Spokane, Portland & Seattle, Texas and Pacific, and others order special calendars from the firm.

Pan-American and Northwest airlines use Brown & Bigelow specials, as do also large firms such as Minneapolis-Moline, Allis Chalmers, Massey-Harris, International Harvester, Massachusetts Mutual Life, U. S. Royal, Kelly-Springfield, Westinghouse, Hotpoint, J. I. Case, Deere & Co., Sylvania Electric, Libbey-Owens-Ford, Sun Oil, Youngstown Sheet and Tube, General Tire, Fisk, Allen-Bradley, Worthington Corp., Austin-Western, Dr. Pepper, and a host of others.

The special jobs are designed for farm, home and office and for the export trade. These big

calendar runs are from 10,000 to a million pieces and are prepared a full year in advance.

The pocket type calendar has a distribution of more than 5 million pieces.

JOSEPH H. SUMMERS
Brown & Bigelow

FOREIGN MEDICAL GRADUATE EDUCATION

The United States helped meet the world's need for better medical care last year when more than 6,700 foreign interns and residents from eighty-eight countries around the world trained in American hospitals, according to a survey recently released by the Institute of International Education. Of this group, 4,753 served as residents and 1,988 trained as interns in hospitals throughout the United States.

An increase of 10 per cent over the previous year, the substantial rise was due chiefly to the greater number of young physicians coming here from the Far, Near and Middle East. More than two-thirds of these doctors traveled from these areas and Latin America, reflecting the deep need in these countries for improved medical care and the lack of local training facilities.

Medical men, as usual, outnumbered medical women. Only 908 (13.5 per cent) of the total group were women, with the Philippines sending more women proportionately than other countries.

In seeking the top-caliber medical training available in the United States, these young medical students were scattered throughout forty-four states, the District of Columbia, Hawaii and Puerto Rico. However, most of them (75 per cent) were concentrated in ten states, with one-quarter of them in New York State hospitals, and one-half of them in hospitals in Ohio, Illinois, Massachusetts, Pennsylvania, New Jersey, Missouri, Maryland, Michigan, and Texas.

The four hospitals with the largest group of foreign interns and physicians were Bellevue in New York City, Boston City in Boston, Medical Center in Jersey City, and Henry Ford in Detroit.

The Institute survey, called "Open Doors" and conducted annually to determine the number of foreign students, physicians, and scholars studying in our country, also reported 3,854 foreign students studying in the various medical sciences—dentistry, medicine, nursing, pharmacy and premedical studies in United States colleges and universities. This represents about 9 per cent of the total num-

ber of foreign students (40,666) in the United States for 1956-57.

The "Open Doors" survey also reported on the number of American students studying medicine abroad during the 1955-56 year, with the largest concentrations in Europe and Canada. Of the 996 students from the United States studying in Switzerland, 669 were in the field of medicine; 319 Americans were pursuing medical studies in Italy; 174 in the Netherlands, and 293 in Canada.

The number of foreign and American medical faculty members who participated in the exchange movement last year was relatively small. One hundred eighty foreign medical scholars came to the United States and eighty-one American faculty members in the field of medicine went abroad. The latter figure, however, represents an almost 100 per cent increase over the forty-five American medical faculty personnel who went abroad the preceding year. This increase could be indicative of a trend on the part of the American medical profession in establishing medical exchange as a two-way road.

Institute of International Education

COUNSELING PARENTS

(Continued from Page 722)

cated to the normal children, with consequent emotional hurdles for them.

Parents whose child is multiply handicapped often have special needs in counseling. If any sort of physical or health problem has been presented, as is the case, for example, with a cerebral palsied child, it is natural that the parents have focused their attention on the more visible and care-requiring physical problems. To find that the child has the additional handicap of mental retardation is often an entirely new idea to them, and hence additional time for discussion may be needed.

In counseling the parents of mentally retarded children, as in any other area of social interaction, it is unrealistic to expect complete success. We need to expect degrees of success and degrees of failure, and to anticipate realistically that, despite our best efforts, we will sometimes fall short of our goal. As a basic procedure, however, success can most often be expected when counseling includes the honest, sympathetic giving of factual information in ways which can be understood, on a time dimension which permits repeated contacts and includes gradual planning.

President's Letter

COST OF MEDICAL CARE

Much has been said and written about the high cost of medical care. As so often proves to be true, however, when the facts are assembled and carefully analyzed, it becomes obvious that the increase in the cost of medical care actually has not kept pace with the increase in the cost of other services or facilities or goods. It is well to call this to the attention of those who are discussing this problem. In this respect, it would be eminently worth every physician's while to read the recent analysis of this problem by Dr. Frank G. Dickinson, director of the Bureau of Medical Economic Research of the American Medical Association. He found that the total spent for medical care in the United States in 1956 was \$12,106,000,000. This sum included expenditures for hospital care, drugs and sundries, dentists' services, physicians' services and all other forms of medical care. Of this amount, \$3,269,000,000 was paid for physicians' services, and \$3,451,000,000 was paid to hospitals. It is worthy of mention that in that same year \$9,360,000,000 was spent for alcoholic beverages and \$5,681,000,000 for tobacco. The year 1955 was the first in which the number of dollars spent for hospital services was greater than the number spent for physicians' services. This situation also obtained in 1956.

Actually, it was found that that portion of the medical-care dollar paid out for physicians' services decreased between 1952 and 1955. Whereas in 1952, 28.5 cents of each medical-care dollar went to physicians, in 1955 only 27.2 cents was spent for physicians' services. Moreover, it is worth mentioning that in 1956 consumers spent \$3,581,000,000 for personal articles or care, such as toilet articles and services in barber and beauty shops and baths—far more than was spent for physicians' services during this year. These are impressive facts, and they should be known by physicians generally.

Now, to turn to a situation in Minnesota more or less closely related to this problem of the cost of medical care, I should like to dwell for a moment on a matter which affects every physician in the state. From time to time, attention is called to the fact that the yearly expenditures by the state of Minnesota for medical care under the provisions of the Old Age Assistance Plan are gradually increasing. Last year that figure was \$17,000,000. It should be stressed that in this particular instance the so-called medical care includes such broad factors as expense of hospital care, nursing homes, drugs, dentists and all other services, and that only 11 per cent of the total amount actually went for physicians' fees. This stresses the fact that the term, "medical care," can be very misleading. Probably a better appellation, and one more nearly accurate, would be "health care." I wish to make it very clear that I am not trying to condone the ever-increasing costs of living in the United States, and neither do I consider it necessary to be an apologist for physicians. I do believe, however, that it is worth while to point out that the costs of medical care, and particularly physicians' fees, actually are lagging behind the general increase in the costs of living.

It is important, also, to remember that physicians are not so voluble, not to say verbose, as are certain members of some groups who seem to be unwilling or unable to perceive that the fee received by the physician is a very small part of that impressive aggregate spent annually for what is designated by the ambiguous term, "medical care."

A large, elegant handwritten signature in dark ink, reading "J. M. Bergen". The signature is fluid and cursive, with a large loop at the end of the last name.

President, Minnesota State Medical Association

Committee Action

A Case-Finding Program for the Control of Tuberculosis in Minnesota

Your Tuberculosis Committee suggests the following case-finding methods, many of which are being carried out at the present time, which should develop into a good comprehensive and sustained tuberculosis control program in Minnesota and possibly lead to the ultimate eradication of the disease:

Accreditation of Minnesota Counties for Human Tuberculosis Control

This accreditation program was established in Minnesota in 1941 and is sponsored by the State Medical Association, the Minnesota Department of Health and the Minnesota Tuberculosis and Health Association. The qualifications of the accreditation program are as follows:

1. The death rate from tuberculosis must be 10 or less per 100,000 population for a period of five consecutive years.
2. At least 90 per cent of the seniors in the high schools in the county must have been tuberculin tested, with a reaction rate of 10 per cent or less.
3. At the present time, sixty-five counties of the eighty-seven have met the accreditation qualifications and of the twenty-one counties not yet accredited, all but three have met the first qualification—having a death rate less than ten per 100,000 population.

Your subcommittee recommends that the accreditation program be continued on an accelerated basis to bring about a situation as soon as possible whereby all of the eighty-seven counties in the State of Minnesota have been accredited. The Minnesota Tuberculosis and Health Association is currently engaged in speeding up this accreditation program.

The committee further recommends that when the entire State of Minnesota has been accredited that steps be taken immediately to set up more rigid standards of qualifications.

It must be constantly emphasized to the general public that when a county has met the present qualifications of accreditation in tuberculosis control, it does not mean that said county has completely eliminated the tuberculosis problem but that it be construed as a milestone in tuberculosis control. Raising the standards of qualifications will help to keep the general public informed on the fact that tuberculosis is far from being eradicated and thus help to dispel apathy.

*Accreditation of Minnesota Counties
School Certification
Tuberculin Testing Surveys
Routine X-Ray Examinations
Routine Tuberculin Testing*

School Certification

The committee recommends that the Certification of Schools by the American School Health Association be continued in Minnesota. The qualifications in Minnesota for certifying schools in tuberculosis control were prepared by a subcommittee composed of Dr. E. A. Meyerding, Chairman, Dr. Lewis Jordan and Dr. S. A. Slater, in 1945, and are as follows:

Class "A" Certificate

1. From 95 to 100 per cent of the children have been tested at least every other year.
2. All reactors in high school have been x-rayed. (It is strongly recommended also that reactors among grade school children be x-rayed.)
3. All non-reactors throughout the school shall be retested every two years, preferably every year.
4. All personnel and employees of schools shall be tuberculin tested. Reactors shall be x-rayed, and non-reactors retested every two years.
5. All students and personnel who have progressive tuberculosis must be removed from school until adequate treatment has been administered and the danger of contagion is remote.
6. An educational program shall be a requirement for teachers.

Class "B" Certificate

The same requirements as for Class "A" except that only 80 to 95 per cent of the children from the kindergarten through high school are tuberculin tested.

Keeping a permanent record of the rate of tuberculosis infection in children and tracing the source of infection is of tremendous value as a case-finding method.

Community-wide and County-wide Tuberculin Testing Surveys

This committee strongly recommends that the community-wide and county-wide tuberculin testing be continued in the State of Minnesota.

To date, four counties—Meeker, Lincoln, Lyon and Kittson, have had a county-wide tuberculin testing survey. Cottonwood County is being tested at the present time.

To date, there have been several community-wide surveys—the most prominent and biggest being the city of Hastings with a population of some 6,500 persons.

It is reasonable to assume from a study of the results of the mass tuberculin testing done thus far, that an overall 25 per cent of Minnesota's 3,000,000 plus persons, or about 750,000, are reactors to the tuberculin test. In other words, we have approximately 750,000 persons in Minnesota who are harboring the germs of tuberculosis—a huge reservoir of tubercle bacilli—fantastically large when compared to the infinitesimally small reaction rate in cattle, which is less than 2/100 of one per cent (two in 10,000).

It is strongly recommended that this mass tuberculin testing be speeded up in some manner so that the people of our state can avail themselves of this case-finding program. Certain obstacles exist that make it difficult to speed up a program of this kind and one of the main difficulties is the lack of x-ray facilities at a reasonable cost. Another difficulty is the limited nursing service which prevents adequate follow-up of those found to react to the tuberculin test.

This committee feels that it is of paramount importance that the persons in Minnesota who are harboring the germs of tuberculosis be identified, not only in the interest of their own health but also because it would give the official health agency accurate data as to the tuberculosis situation in our State of Minnesota.

Routine X-Ray Examinations of Hospital Admissions

We wish to go on record as vigorously endorsing the program of x-raying all persons coming into our hospitals in Minnesota. We suggest that we reaffirm our position with regard to this program and seek the help of the Minnesota Tuberculosis and Health Association in continuing to encourage the program in all of the counties in the state. Nearly 53 per cent of the hospitals now take routine x-rays of all admissions. It is estimated that 81 per cent of Minnesota's hospital patients now receive chest x-ray examinations.

We suggest a speakers' bureau, composed of doctors who are definitely interested in the field of tuberculosis, who would stand ready to attend county meetings, hospital staff meetings, wherever there was a need for a good selling job on routine x-ray of hospital admissions. Members of a speakers' bureau could also be available to speak at various meetings throughout the state. The Minnesota Tuberculosis and Health Association is capable of arranging meetings and they would provide an excellent avenue of education and extremely effective method of reaching the people as to the current hazards of tuberculosis and ever dangerous aspects of the disease.

Tuberculin Testing and X-Raying in Old Age and Nursing Homes

This committee recommends the continuance of this program and that it should be a rule of every old age home either to make a tuberculin test or x-ray examination of every old aged person on admission.

This program is important because we are finding more tuberculosis today in the older people and we are discovering too frequently that our older people are the source of contact for younger people. The increase in population of persons over sixty-five is becoming bigger and bigger every year. This means that the persons who are harboring tubercle bacilli are given a much longer span of years to spread the disease than formerly. It is imperative that we watch closely our older people and give them the advantage of our tests if we hope to properly protect those who associate with them.

Tuberculin Testing in Industrial Plants

Industrial employers are becoming more interested in the better health of their employes and the employer who includes in the physical examination of his employes the routine tuberculin test and x-ray is indeed following a wise course.

We strongly recommend that tuberculin testing and x-ray of the employes of industrial groups be endorsed by this committee.

Tuberculin Testing in the Doctor's Office

Encourage every family physician to routinely administer a tuberculin test to every patient coming into his office, following determination that the patient is not a reactor.

In case the patient is either a former reactor or a new reactor, the physician should be encouraged to follow through and see that the patient has an x-ray with proper interpretation.

It is the opinion of this subcommittee that there is perhaps no better way to stimulate the interest of the general practitioner in the value and importance of the tuberculin test than by his active participation in either a school, community-wide or county-wide tuberculin testing survey. When he actually sees up to 25 per cent of the persons in his community or county reacting to the test he becomes impressed with the prevalence of infection and the potential active cases of the future for it is estimated that 5 per cent of all reactors to the tuberculin test will sometime break down with active tuberculosis.

Summary

In analyzing the productive opportunities for case-finding, this committee sets forth the following
(Continued on Page A-53)

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

"MEDICARE" IS BIG BUSINESS IN MINNESOTA

When the Dependents' Medical Care Program began in December, 1956, most people thought it would be a limited program. Both government and state medical association officials believed relatively few doctors and patients would be involved in Minnesota.

It is now obvious that all hands were wrong. When contractors and auditors began to check up in preparation for winding up accounts at the end of the fiscal year, the following figures were uncovered:

The total number of claims processed through the Minnesota State Medical Association through July 31, 1957, was 1,553. The total amount of money paid to physicians was \$115,277.55.

The number of claims received daily in the State Office averages twenty-nine per day and is increasing steadily. The operation is obviously becoming a major activity of the Association.

Red Tape Inevitable

The observation that Medicare will prove to be a dry run for other government medical programs is frequently made, and with obvious justification. It should be said, however, that army officials in the Office of the Surgeon General have been co-operative and understanding, and the delays and red tape associated with administration of the program have been only what is inevitable in any government undertaking.

Recent delays in payments have not been the fault of the officials in charge since Medicare had to wait for funds along with a good many other government operations while Congress argued about other things.

Figures Are Staggering

In that connection, some interesting figures on the subject of government medical care were assembled in a recent *Journal* of the Michigan State Medical Society.

It appears that a staggering total of 33,569,000 persons are eligible for full or part-time medical care at government expense right now. That num-

ber includes the 5,200,000 military personnel and their families who were voted into Medicare last year, plus 22,599,000 veterans, 5,100,000 recipients of public assistance, 370,000 Indians and Alaskan and 300,000 other dependents of the U. S. Public Health Service.

The number increases each year and so does the demand. America is the only nation in the world which has developed a workable alternative to compulsory government insurance to meet that demand. The importance of strengthening and extending the typically American answer to government medicine becomes urgent in the light of the above figures.

FEES INCREASED AND AUTHORIZATION TIME EXTENDED IN HOME-TOWN CARE PROGRAM

Changes in procedure have just been announced with respect to both fees and to authorizations required in the Home-Town Care program for veterans.

Authorization for as long as a year in advance can now be made in the case of patients in need of long-term care. If conditions warrant and the co-operation of the attending physician is assured, monthly re-authorization can be eliminated in these cases. The physician may bill the Veterans Administration each month for services rendered, but he is required to report on these long-term cases only every three months.

A new fee schedule has been announced also by the Central Office of the Veterans Administration. Maximums have been increased in accordance with this schedule in a considerable number of instances.

At the same time, VA medical officers have been instructed that fees shall not exceed those usually paid for similar services in the community. The increases are applicable all over the country, however, regardless of whether or not an intermediary agreement exists between medical associations and the Veterans Administration.

Minnesota's contract expired in 1954 and the Minnesota State Medical Association did not enter into the altered type of contract offered at that time. Under the present arrangement in

Minnesota, VA officials contract directly with physicians who are willing to provide home-town care.

TAX RELIEF FOR CANADIAN SELF-EMPLOYED

Of interest in connection with continuing discussions of the Social Security question for physicians is recent news about Canada's solution to the problem.

According to the general secretary of the Canadian Medical Association, the Canadian parliament has adopted an amendment to the Canadian Income Tax Act which is comparable to the Jenkins-Keogh bill which the American Medical Association has been supporting. The Canadian limits of deferment are said to be 10 per cent of income, or \$2,500 a year, whichever is the lesser. Under the Jenkins-Keogh bill, the limits would be 10 per cent of earned income or \$5,000 instead of the \$2,500 in the Canadian law.

It is interesting to note that Britain, stronghold of "cradle-to-grave" security was the first major nation in the world to adopt comparable legislation for the self-employed.

Hearings on the Jenkins-Keogh bill and other tax measures have now been scheduled for January by Chairman Jere Cooper of the House Ways and Means Committee.

MAJOR PROTECTION POLICIES ARE POPULAR

Major Medical Expense Insurance is a recent development among current programs for protection against major misfortunes. Its rapid public acceptance should be highly encouraging to all who are interested in extension of voluntary prepayment plans.

The first policies were sold in 1949, and when the reports for 1956 are all in, it is expected by insurance experts that more than ten million people in the United States will be shown to be covered.

Included in the ten million are 72 per cent of members of the Minnesota State Medical Association who signed up during the charter enrollment period for the Association's new Group Major Hospitalization Program, initiated with approval of Council and House of Delegates in May.

This ready acceptance by doctors of this type of group protection not only insured the successful launching of another insurance program under

State Association auspices, it is also good public evidence of the worth of voluntary prepayment plans as a cushion against medical and hospital expenses in case of illness.

If the doctors, who know best how costs can mount, like group plans for protecting themselves and their families, their patients are likely to be even more easily persuaded.

LEGISLATIVE REVIEW, 1957

Below is an interesting brief summary of what state law-makers did about health and medical matters at the 1957 session of the Legislature. It is borrowed from *Conference Call* published by the Minnesota Public Health Conference and compiled for public health workers, but it concerns enactments of equal interest to physicians. Many of the actions listed may have escaped notice at the time of passage.

Aging

The appointment of a special assistant on aging in the unclassified service of the Department of Public Welfare was authorized and county welfare boards may employ county service co-ordinators and "to further the well-being of the aging" may appoint citizens' advisory committees. (C. 762).

Children

An advisory board consisting of twelve members was created to aid in "formulating policies and encouraging programs" for handicapped, gifted, and exceptional children. (C. 778).

The Minnesota Residential Treatment Center for emotionally disturbed and psychotic children was authorized. It is to be located within 25 miles of the Minneapolis campus of the University and be under the management of the commissioner of welfare. (C. 957).

Civil Defense

The State Board of Health was authorized to procure and store blood typing serums, donor and recipient sets, and blood containers to collect citrated whole human blood for transfusion purposes, and to store in hospitals, etc., a year's supply to facilitate collection and use; \$50,000 was appropriated. (C. 653).

County Nursing Service

Cass County was authorized to levy two mills for public health nursing. (C. 213).

General Health and Safety

Authority was given to the State Board of Health to conduct programs "in home safety, designed to prevent accidents and fatalities resulting therefrom," and for the purpose may co-operate with local boards of health, the Minnesota Safety Council and other interested groups. (C. 290).

A law providing for a fire safety code was passed, which will enable the state fire marshal to adopt and enforce standards for fire protection in hospitals, nursing homes, rest homes, board and care homes, as defined by the State Board of Health, and in schools, hotels, et cetera. (C. 723).

The State Board of Health also was authorized to adopt and enforce reasonable regulations for the control of atmospheric pollution and ionizing radiation. (C. 361).

Hospitals

A law of state-wide application was enacted to permit hospital districts to be formed of towns, villages, and cities within any county of the state. (C. 640).

Proceedings undertaken by Rice County under the hospital district law applicable to that county (C. 400, Laws 1955) were legalized. (C. 3).

Where a town with a village therein has a population of from 2,000 to 10,000 with a 17-mill levy producing \$1,000 per governmental section, it may incur indebtedness not to exceed \$500,000 and may apply for federal aid for hospital construction. (C. 122).

Any city, village or town, the valuation of which consists of more than 25 per cent iron ore, may lease any community or municipal hospital to any incorporated, non-profit association. (C. 116).

Joint hospital facilities were authorized for Ramsey County and St. Paul. (C. 938).

The creation of a hospital district was authorized in any county where the normal capacity of all public and private general hospitals licensed by the State Health Department is not less than sixty-three nor more than seventy beds. (C. 315).

Creation of a hospital district was authorized in a county having over 14,000 and less than 15,000 people and over thirty and less than fifty-six townships. (C. 539).

Members of a county hospital board who are not members of the county board may receive 7½ cents per mile for traveling to meetings. (C. 83).

Local Health

The 1947 County Board of Health Act which authorized a county to form a county health department or to join with others in forming a multi-county health department was amended to provide for an increase in the levy from one to two mills for support of such a department. (C. 470).

Municipalities were forbidden to license the service of meals at fairs conducted by county agricultural societies. (C. 59).

Marriage Reporting

On January 1, 1958, clerks of court will begin reporting to the State Board of Health's Vital Statistics Section data on marriage licenses in order to permit the establishment of a state-wide index and the collection of marriage statistics. (C. 886).

Mental Health

The interstate compact on mental health was enacted into law. It authorized the Commissioner of the Department of Public Welfare to make interstate agreements concerning the institutionalization of mentally ill in and the responsibilities of party states. (C. 326).

Nursing Homes

The only bill of the three-bill package on nursing homes to pass was the one stating that by a majority instead of a unanimous vote, a county board may establish a nursing home. (C. 865). Those which failed were: The \$2,000,000 nursing home construction subsidy bill, and the bill authorizing towns, villages, and cities to construct and operate nursing homes.

Sanitary Disposal Authority

Two or more villages or cities of the second, third, or fourth class, situated within 25 miles of the city hall of a city of the first class with a population in excess of 500,000 may create a sanitary disposal authority. Such authority may provide for the sanitary collection of garbage and refuse. (C. 450).

Tuberculosis

A County Sanatorium Commission, with the consent of the Commissioner of the Department of Public Welfare, the State Board of Health, and the county board, may employ a tuberculosis control officer who shall be a licensed physician and

have the powers and duties of health officers and boards of health relative to tuberculosis. (C. 302). The use of county sanatoriums "for the care of persons afflicted with a malady, deformity, or ailment other than tuberculosis . . . which can properly be remedied by hospital care, service, and treatment, excluding nursing home patients" was authorized. (C. 691).

The court may issue a warrant committing a person to a tuberculosis sanatorium or public hospital where he shall remain until he is discharged and is not contagious. The court may, with the consent of the commissioner of public welfare, order the patient confined at the tuberculosis unit at Anoka State Hospital until such time as the commissioner determines that he may be safely cared for at the sanatorium or hospital named in the court's findings. Also, if any patient willingly leaves the sanatorium or hospital without consent, the court, upon request of the superintendent or chief medical officer, and with the consent of the commissioner of public welfare, may amend its order and confine such person to the tuberculosis unit at Anoka State Hospital. (C. 317).

Where a person has resided in Minnesota throughout the year preceding commitment, but not in any one county during such time, the Commissioner of Public Welfare shall pay to the county sanatorium where the person is received, the same fee that is received for non-residents. The fee shall be paid out of funds appropriated for the maintenance of county sanatoria. (C. 654).

Medical laboratory employes of the State Board of Health and nurses contracting tuberculosis in the course of their employment were placed under the special workmen's compensation provisions which allow payment of medical care and compensation at two-thirds of salary. (C. 31).

Welfare

The Commissioner of the Department of Public Welfare was authorized to make grants to any city, county, town, or village, or combination of them, or to non-profit corporations in assisting with the establishment and operation of community service mental health programs to provide (a) preventive, (b) educational, (c) consultative, (d) out-patient treatment, and (e) rehabilitation services. Grants made for mental health services, whether provided by a local facility or through contract with

other public or private agencies, shall not exceed 50 per cent of the expenditures nor 50 cents per capita for the area served. To come within the act, communities shall establish nine-member community mental health boards. (C. 392).

CORONARY INSUFFICIENCY DISEASE

(Continued from Page 695)

ability to reproduce the pain by pressure over tender points or by torsion of the thorax is of great help in convincing and reassuring the patient. The observation of the patient's gestures enables one to decide more easily what maneuver to use to reproduce the pain. A somewhat similar point has been made by Harrison.⁴

Summary

Patients with coronary insufficiency pain frequently use gestures to describe their pain which are quite characteristic and in contrast to gestures used by people with noncardiac chest pain. The placement of the flattened palm and fingers over the midsternum and slight movement horizontally across the chest were the most commonly used maneuvers. These and other gestures are discussed.

For the practitioner who sees many patients per day, perhaps at home under unfavorable circumstances for prolonged questioning or detailed examination, or who may see patients in the office under hurried circumstances, the observation of these coronary insufficiency gestures may provide some guide to the type of investigation to pursue.

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History of Medicine in Minnesota

NOTES ON THE MEDICAL HISTORY OF BECKER COUNTY

G. G. HAIGHT, M.D.

Audubon, Minnesota

Becker County, named in honor of General George L. Becker, had been a part of Stearns County and later of Douglas County, but, in 1858, it was established as a separate county by an act of the legislature.

The surface materials of this territory were deposited during the glacier period and are known as a drift formation. The soil in the eastern and central parts is made up of sand and gravel with a small amount of clay, while the western part is mainly clay with isolated areas of sand and gravel.

Becker County contains 296 lakes with areas varying from 40 acres to more than 7,000 acres, the largest being Cormorant Lake, and many ponds of 5 to 40 acres.

The highest point of land in this region of the state, 1,750 feet above sea level, is part of a dividing ridge in the northeastern corner of Becker County. Water from the eastern slope of this ridge drains into the Mississippi River and eventually into the Gulf of Mexico. Water from the western slope drains into the Red River and eventually into the Arctic. Both of these rivers begin their flow in a direction opposite to their general course and final destination.

Four hundred and sixty species of trees and natural flowers have been found. Pine and fir, from which much lumber has been taken, were found in the eastern sandy part, while, oak, ash, elm, and poplar abound in the western part. Medicinal plants, such as ginseng, snake root, buck root, kidney wort, and poisonous plants including poison hemlock and poison oak and sumac, which are poisonous externally, originally existed. The state flower, the pink lady slipper, was also found in Becker County. One of the most important food plants to the early Indians was wild rice which is still harvested by them in this region today.

In olden times, most of the animals indigent to the United States, from the buffalo and moose to the mouse and the mole, were found in the county. There were also many fish such as pike, pickerel, bass, perch, tullibee, and sucker. As many as 262 different kinds of birds have been identified, including eighty-three water fowl and 179 land birds.

How was this country first peopled? Bancroft, the noted historian, expressed his belief that the Indians are of Mongolian descent. Be that as it may, it is unprofitable to speculate.

In 1825, the Sioux and the Chippewa tribes were feuding over the Northwest Territory, so the authorities at Washington convened a grand congress of Indians at Prairie du Chien, Wisconsin, under Governor Clark of Missouri and Governor Cass of Michigan. This congress established a boundary line between the Sioux and Chippewa. In Minnesota, this boundary line ran from Ottertail Lake north to the Buffalo River, down this river to the Red River. This placed most of Becker County in the Chippewa Territory. Later treaties ceded all land in the county to the United States government. In exchange, the Chippewas received part of White Earth Reservation, an area of land 36 miles square.

In 1802, the Northwest Fur Company had come to White Earth, which was then on the old Red River Road to Pembina and Ft. Garry, now Winnipeg. By the treaty of 1867, 700 of the Indians at Leech Lake were to be moved to the

White Earth Reservation. About 150 arrived on June 14, and that date is still celebrated every year. Machinery for a saw mill was moved here in 1868, and logs were sawed to get lumber to build a store and houses. Two hundred and forty acres of land were broken that summer. Paul Beaulieu was sent by the agent, B. J. Bassett, as overseer.

The first medical men to appear in Becker County were those assigned to the White Earth Indian Reservation by the United States government. **Dr. F. S. Boldle** came from Owatonna, Steele County, in 1865 after serving as surgeon in the U.S. Army. He was then appointed government physician for the Chippewas at White Earth. In 1878, he went to Grinnell, Iowa.

Dr. David Pyle, who had been a member of the state legislature from McLeod County in 1868, was appointed to White Earth in 1869. The following year, he settled on a claim in what is now Audubon Township. He was very helpful to the early settlers and was held in great esteem by them. He left the county in the early seventies.

Dr. Thornton Parker, who had graduated from the Royal University at Munich, was surgeon at White Earth for a time. He moved away in 1881.

In 1881, **Dr. C. N. Hewitt** reported the following diseases at White Earth, Leech Lake, and Red Lake: venereal, 171; diathetic, 564; tuberculosis, 424; parasitic, 183; respiratory tract, 639; eye, 347; and ear, 114.

The Reverend Joseph Gilfillan,* an Episcopal missionary who was born in Canada and died at White Earth, June 12, 1902, reported that there was severe smallpox during the winter of 1883. He constantly saw children clad only in cotton shirts, cotton leggings, and moccasins standing in the road in the cold, snowy weather, coughing violently from whooping cough. This missionary had come to White Earth to assist Reverend Johnson in mission work and became very much respected and loved by the Indians among whom he worked.

In 1901, Dr. Hewitt complained to Washington that a smallpox epidemic was being handled improperly at White Earth. **Dr. W. J. Stephenson**, agency physician, thought he had had all smallpox suppressed. He then found four cases and ordered more vaccine, saying he would vaccinate any Indian who had not had smallpox and would keep at it until all were immunized.

Dr. Charles Monroe Cannon was appointed physician in charge of the Reservation in 1889. He stayed there a little more than a year, until 1890, when he returned to Alden.

The first white woman to come to White Earth was Mrs. John Cook, the wife of the overseer of farming, who came from Wisconsin in the spring of 1870. In the spring of 1871, the Cooks moved to a new home and farm near Audubon where, a year afterwards, all the members of the family were cruelly murdered by Chippewa Indians. The site is now marked by a monument enclosed by a chain fence. Bobolink and Boanece were the principal actors in this tragedy. They were both arrested, but Boanece was released for lack of evidence. Bobolink was tried by a court of law at Detroit, where Doctors Pyle and Calkins were witnesses for the prosecution and Doctors Sully and Maltby were witnesses for the defense. After two hours of deliberation, the jury rendered the verdict of "guilty of murder in the first degree" and recommended the death penalty. While waiting in the St. Paul jail for the Governor to fix the date of the execution, Bobolink died.

Before leaving the history of the White Earth Reservation, we might cite what

*Jordan, Phillip D.: *The People's Health, the History of Public Health in Minnesota*. Minnesota Historical Society, 1953.

the first agency manager, Major J. B. Bassett, said regarding the treatment of the Indians by the government:

"My experience with the Indian Department shows to my mind the most incomprehensible absurdity that a civilized people ever attempted to impose upon an uncivilized race. To attempt to civilize a people and at the same time prevent them from adopting any of the arts or advantages of civilization is to my mind absolutely absurd and ridiculous."

The United States Government was anxious to open up the county to the northwest. To do this, they gave the North Pacific Railroad a land grant of every odd section, 20 miles each side of the center of the proposed road. The first exploratory expedition for the Northern Pacific went south of the present route, but on the return trip from the Missouri River, which had been found feasible to bridge, the explorers went north of the site of the town of Fargo and followed about the present route. The grading began at the eastern border of the county in mid-October, 1870, and advanced over the western border by mid-November, 1871. By December first, trains made regular trips to Oak Lake Cut, and they continued to do so on through the winter, but only two trains went on from there to Moorhead, for the road was blocked by snow and was not opened until mid-April although \$30,000 were spent in a vain attempt to keep it open by shoveling.

The first village was at Oak Lake, where the Northern Pacific was making the biggest cut from Duluth to the Missouri River. By the time the rails were laid, the population was 400, with four stores, two hotels, a dance hall, and many tents. The first political meeting in Becker County was held here, with Governor Austin the principal speaker. During the meeting, two dogs, one belonging to a settler and the other to a gambler, began to fight. Angered that his dog was getting the worst of the fight, the gambler went looking for the settler. By mistake, he hit the wrong man with his revolver leaving a mark which that man carried to his death.

In 1868, the first settlers at Oak Lake were so pleased with the land that they signed up without leaving their wagons. Henry Way, A. W. Sherman, and L. D. Sperry put up hay and returned to Battle Lake for the winter, but were back with their families the next spring.

On the first exploratory expedition to locate the Northern Pacific right-of-way, a Boston correspondent by the name of Charles Carlton Coffin accompanied the surveying crew. He was so taken with the land that he gave the name Park Region to this beautiful country. Bayard Taylor, a celebrated traveler, pictured the region as one of the most beautiful he had ever seen. On his return to Boston, Coffin lectured on the opportunities of this region. Meetings were held, and the New England Colony was formed to take advantage of the law that Congress had passed at the close of the Civil War giving to every soldier, sailor and marine, 160 acres of land which could be taken under the Homestead Act. Committees were appointed to visit the western lands. Some came via St. Cloud and then by wagon to Becker County. Some came via the lakes to Duluth, a town of 300, and then by railroad to Crow Wing and by wagon to Becker County. They purchased all the odd sections in Detroit township from the Northern Pacific. The articles of incorporation placed the affairs of the colony in the hands of one man, Colonel George H. Johnson of Boston, who was to act as trustee until his successor should be chosen. After several years, the whole of this valuable acquisition came into his hands. Some of the members lacked staying qualities for, by 1873, they began to scatter, their number dwindling down until of the 300 or more many had returned to their former homes. Perhaps the great grasshopper plagues which swept over Minnesota in 1871 and 1872 and again in 1874 and 1875 had something

to do with this. The grasshoppers were so numerous at this time that they obscured the sun at noon and stopped trains by making the rails so slippery that the trains could not move. During this time, the work that the settlers got from the railroad saved many of them from starvation.

In 1871, the county was organized politically. The governor appointed three commissioners and **Dr. David Pyle** was appointed county auditor. Without any buildings in which to hold meetings, the various county officials held forth at their places of business, mostly at Oak Lake and then at Lake Park and Detroit. The biggest scrap came over the site of the county seat. Audubon was favored at first, and Lake Park sided with the Audubon group, but in 1877, the general election decided that the county seat should be at Detroit. It was not until 1885 that a court house was ready for use.

The first doctor to come to Detroit was **Dr. Dexter Maltby**. He arrived in April, 1871. There were four tents, a frame store, and a log hotel. Dr. Maltby's practice that season was mainly among the employes of the railroad at Oak Lake. In the Civil War, he had been in the Union Army and studied medicine afterwards, receiving a certificate from the examining board in 1871. He was in Detroit about ten years.

Not many physicians located in Becker County in the 1870's. **Dr. C. A. Lampanius** was coroner in Audubon from 1874 to 1880. **Dr. John Froshaug** came to Lake Park in 1877. He was delegate to the Republican State Convention and later coroner. At the very end of the decade, **Dr. John Carman** came to Detroit. He became one of the most beloved physicians of the county and a real credit to the medical profession.

During the 1880's **Dr. Aretus K. Norton** came to Becker County, locating in Detroit. In the same decade, **Dr. Edward Hoit** arrived. He had homeopathic as well as regular medical training. At about the same time, **Dr. Emma K. Ogden** established herself in Detroit. **Dr. Niles R. H. Jewell** came to Lake Park in 1886 or before. **Dr. Joseph G. Hodgkinson**, a graduate of the St. Paul Medical College in 1886, located immediately in Detroit.

A number of these physicians are no longer listed after the early nineties, but a fair number arrived during the last decade of the 19th century. Among them we find **Dr. W. M. Morton**, who was listed in Detroit in 1893. **Dr. S. S. Jones** was coroner of Frazee from 1897 to 1899, and **Dr. Thomas Howell** was in this little town in 1898 when it had only 279 inhabitants. In Lake Park, which was considerably larger than Frazee, **Dr. H. E. Armstrong** practiced in 1896, **Dr. Roland T. Gilmore** in 1898, and **Dr. M. B. Smith** in 1900. **Dr. O. K. Winberg**, a Norwegian physician who came to Lake Park in about 1893, was later one of the organizers of the movement that resulted in the establishment of Sand Beach Sanatorium, and for many years he was one of its directors. Another physician who is important in the Medical History of Becker County, was **Dr. Leonard Case Weeks**. He came to Detroit in 1896. He held a number of public offices, medical as well as non-medical, giving services in a difficult country practice for a quarter of a century. This strenuous work took its toll, and he passed away at the early age of fifty-seven years.

Biographical Sketches

Dr. Henry Edward Armstrong is listed in Lake Park in 1896 and 1898. He received his medical education in Canada, graduating from Trinity Medical College, Toronto, in 1894. He was licensed in Ontario in the same year and on October 8 of the following year in Minnesota. It probably was in this year, 1895, that he came to Lake Park. At that time, he and **Dr. O. K. Winberg** were the only

physicians in Lake Park. In 1897, he was licensed to practice in North Dakota and, in 1898, in Montana, locating in Billings. Dr. Armstrong became well established in Billings, becoming a leading diagnostician. At the time of his death, he was the dean of eastern Montana physicians. He died suddenly at Billings on January 10, 1934, from a heart attack. He was sixty-six years old. Not much is known about his stay in Becker County, no doubt due to the shortness of his stay there. It seems that he did not actually locate in North Dakota.

Dr. Ed. Barton came to Frazee in 1901 when Dr. Benson decided not to return to his practice, which had been handled in the meantime by Dr. E. Carman. The Nichel's-Chisholm Lumber Company had mills at Frazee and hired many lumbermen to run the logs down the river to the mills. To take care of these men, Dr. Barton built a hospital which he continued to operate after the mills had cleared the land and moved west to Washington.

He was much interested in baseball and with the help of the lumber company, always put a good team in the field. He held many offices in the city and in the Clay-Becker Medical Society. In later life, he moved to Minneapolis where he practiced for a time before his death.

A **Dr. Benson** apparently was in Frazee in the late 90's. It seems he left with the intention of returning, leaving Dr. E. Carman in charge of his practice. By 1901, it was certain that he would not come back and Dr. E. Barton took his place.

Dr. F. S. Boldle was a surgeon in the U. S. Army during the Civil War and came to Owatonna, Steele County, in 1865. He was appointed Government Physician for the Chippewa Indians at White Earth Reservation. In 1878, he went to Grinnell, Iowa, and later moved to Oakland, California. He was a member of the Minnesota State Medical Society.

Dr. Charles Monroe Cannon* was born in Wisconsin, August 18, 1861, and had his preliminary education in the public schools of Cherokee, Iowa, and Drake University, Des Moines, Iowa. He received his medical education at Bennett Medical College, Chicago, from which he was graduated in 1888. At first he practiced in Alden, Freeborn County. He was supposedly located in Alden in 1887. If this is correct, he must have started to practice before his graduation and returned there after he finished medical school. He bought the residence of Dr. G. A. Stevenson and there may have been some partnership arrangement at first.

He was appointed physician in charge of the White Earth Reservation in 1889 under Congressman Dunnell. After little more than one year, in May, 1890, he returned to Alden and stayed there until February, 1893, when he moved to St. Paul. There he practiced until his death in 1923. From 1892 to 1895, he was a member of the Minnesota State Board of Medical Examiners. He was elected to membership in the Ramsey County Medical Society and the Wisconsin State Medical Association in 1895. He also was a member of the American Medical Association.

Dr. Cannon married Edith M. Morey, a member of an Alden pioneer family. They had two daughters and one son. He was a highly respected citizen.

*Much of this information is taken from the medical history of Freeborn County, by Dr. Andrew Gullixson, MINNESOTA MEDICINE, January, 1949.

(To be continued in the January issue)

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1. Settel, E.: Rolicton® (Aminoisometradine), a New, Nonmercurial Diuretic, *Postgrad. Med.* 21:186 (Feb.) 1957.
2. Assali, N. S.: Personal communication, May 28, 1956.

SEARLE



Normal glomerulus, showing arteriole musculature, glomerular epithelial podocytes, and "epitheloid" muscle cells of vas efferens.

Meetings and Announcements

STATE

MINNESOTA STATE MEDICAL ASSOCIATION, 105th annual meeting, Minneapolis, May 22, 23 and 24, 1958. Business sessions and exhibits, Minneapolis Auditorium. Headquarters, Leamington Hotel.

NATIONAL

American College of Surgeons, sectional meeting, Des Moines, Iowa, March 27-29, 1958.

American Gastroenterological Association, 59th annual meeting, Washington, D. C., May 30-31, 1958. H. M. Pollard, M.D., Secretary-General, University Hospital, Ann Arbor, Michigan.

Omaha-Mid-West Clinical Society, 25th annual session, Sheraton-Fontenelle Hotel, Omaha, Nebraska, November 4-6, 1957. James J. O'Neil, M.D., 1031 Medical Arts Building, Omaha, Nebraska.

Symposium on Fluorides, Institute of Industrial Health, College of Medicine, University of Cincinnati, Cincinnati, Ohio, December 9-11, 1957. Secretary, Institute of Industrial Health, Kettering Laboratory, Eden and Bethesda Avenues, Cincinnati 19, Ohio.

INTERNATIONAL

Congress of International Society of Surgery, Mexico City, Mexico, October 27-November 2. Dr. L. Dejardin, 141 rue Belliard, Brussels, Belgium.

Fifth International Congress of Internal Medicine, Philadelphia, Pennsylvania, April 24-26, 1958. Edward R. Loveland, Secretary-General, 4200 Pine Street, Philadelphia 4, Pennsylvania.

Inter-American Congress of Pan American Medical Association, Mexico City, Mexico, November 18-22, 1957. Executive Director, Dr. Joseph J. Eller, 745 Fifth Avenue, New York 22, New York.

International Society of Internal Medicine, Fifth International Congress of Internal Medicine, Philadelphia, Pennsylvania, April 24-26, 1958. Edward R. Loveland, Secretary-General, 4200 Pine Street, Philadelphia 4, Pennsylvania.

Pan American Congress of Endocrinology, Buenos Aires, Argentina, November 3-9, 1957. Secretaria-General, Sociedad Argentina de Endocrinología y Metabolismos, Sante Fe 1171, Buenos Aires, Argentina.

Pan-Pacific Surgical Association, Seventh Congress, Honolulu, Hawaii, November 14-22, 1957. Dr. F. J. Pinkerton, Director General, Pan-Pacific Surgical Association, Room 230, Young Building, Honolulu, T. H.

World Congress of Gastroenterology, Washington, D. C., May 25-31, 1958. H. M. Pollard, M.D., Secretary-General, University Hospital, Ann Arbor, Michigan.

PRIZE ESSAY CONTEST, AMERICAN COLLEGE OF CHEST PHYSICIANS

The American College of Chest Physicians is offering three cash awards of \$500, \$300, and \$200 each to winners of the 1958 prize essay contest, which is open to *undergraduate* medical students throughout the world. Essays may be written on any phase of the diagnosis and treatment of chest diseases, including the heart or lungs. The contest closes April 15, 1958. Further information may be obtained from the American College of Chest Physicians, 112 East Chestnut Street, Chicago 11, Illinois.

VAN METER PRIZE AWARD

The American Goiter Association again offers the Van Meter Prize Award of \$300 and two honorable mentions for the best essays submitted concerning original work on problems related to the thyroid gland. The essays may cover either clinical or research investigations, should not exceed 3,000 words in length, and must be presented in English. Duplicate typewritten copies, double spaced, should be sent to the secretary, Dr. John C. McClinck, 149½ Washington Avenue, Albany 10, New York, not later than February 1, 1958.

CONTINUATION COURSES

Medical continuation courses to be presented at the Center for Continuation Study, University of Minnesota, are as follows:

November 4-9	Cardiovascular Radiology for Specialists
November 18-20	Physical Medicine for Specialists
December 5-7	Fractures for General Physicians
January 6-11	Ophthalmology for Specialists
January 9-11	The Newer Drugs in General Practice

For further information concerning the above courses, write to the Director, Department of Continuation Medical Education, 1342 Mayo Memorial, University of Minnesota, Minneapolis 14.

KENNY FOUNDATION SCHOLARSHIPS

The Sister Elizabeth Kenny Foundation announces a continuance of its postdoctoral scholarships to promote work in the field of neuromuscular diseases. These scholarships are designed for scientists at or near the end of their fellowship training in either basic or clinical fields concerned with the broad problem of neuromuscular diseases.

Kenny Foundation Scholars will be appointed annually. Each grant provides a stipend of from \$5000 to \$7000 a year for a five-year period, depending upon the

MEETINGS AND ANNOUNCEMENTS

olar's qualifications. Candidates from medical schools in the United States and Canada are eligible.

Inquiries concerning details should be sent without delay to: Dr. E. J. Huenekens, Medical Director, Sister Elizabeth Kenny Foundation, 2400 Foshay Tower, Minneapolis 2, Minnesota.

UNIVERSITY COURSE ON ADVANCED ORAL PATHOLOGY

The Medical and Dental Faculties of the University of Minnesota will present a course in "Advanced Oral Pathology" during the week of April 28 through May 1958. Both lectures and pathologic slide study will be included. The subjects covered will be: neoplastic and non-neoplastic diseases of the salivary glands, neoplasms of dental origin, bone pathology, soft tissue neoplasms, dermatologic pathology, diseases of the lymphoid system, and oral roentgenographic evidences of systemic disease.

The faculty will include Dr. Robert Lukes, Armed Forces Institute of Pathology; Drs. D. C. Dahlin and Edward Stafne of the Mayo Clinic; Dr. Robert Goltz of the Medical School, University of Minnesota; and Drs. Anand Chaudhry and Robert J. Gorlin of the School of Dentistry, University of Minnesota.

The tuition fee will be \$50, and an additional \$50 will be charged if room and board at the Center for

Continuation Studies are desired. Further information may be obtained from Dr. Robert J. Gorlin, Chairman, Division of Oral Pathology, School of Dentistry, University of Minnesota, Minneapolis, Minnesota.

OMAHA MID-WEST CLINICAL SOCIETY

Twelve guest speakers of national repute will be on the program of the twenty-fifth annual session of the Omaha Mid-West Clinical Society, November 4-7, 1957, at the Sheraton-Fontenelle Hotel in Omaha. Outstanding speakers include: Kenneth E. Appel, M.D., Chairman, Department of Psychiatry, University of Pennsylvania School of Medicine; Alvan L. Barach, M.D., Clinical Professor of Medicine, College of Physicians and Surgeons, Columbia University; Clyde G. Culbertson, M.D., Director, Biological Research Division, Lilly Research Laboratories; James G. Hughes, M.D., Professor of Pediatrics, University of Tennessee College of Medicine; Victor F. Marshall, M.D., Associate Professor of Clinical Surgery and Urology, Cornell University Medical College; John H. Moe, M.D., Clinical Professor and Director, Division of Orthopedic Surgery, University of Minnesota Medical School; Carl A. Moyer, M.D., Professor of Surgery and Head of Department, Washington University School of Medicine; G. O'Neil Proud, M.D., Professor and Chairman of the Department of Otorhinolaryngology, University of Kansas School of Medicine; H. R. Reichman, M.D., Assistant Clinical Professor of Surgery, University of Utah College of

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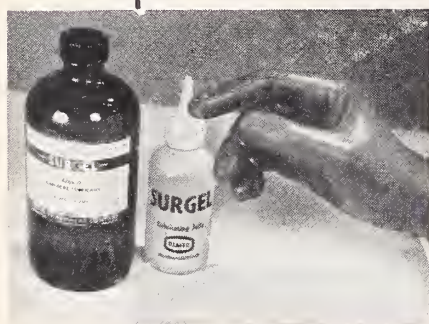
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Medicine; Herbert E. Schmitz, M.D., Professor and Chairman, Department of Obstetrics and Gynecology, Stritch School of Medicine, Loyola University; Colonel John P. Stapp, M.D., Chief, Aero-Medical Field Laboratory, Holloman Air Force Base, New Mexico; and Er. E. Wollaeger, M.D., Associate Professor of Medicine, University of Minnesota Graduate Medical School.

Four full days of postgraduate study are offered at this meeting, which have been approved for Category credit by the American Academy of General Practice. This Silver Jubilee session of the Society will include four panel discussions on Cesarean Section, Pelvic Injuries, Problems of Adolescence, and Clinical Use and Abuse of Steroids.

POSTGRADUATE COURSES

New York University-Bellevue Medical Center Postgraduate Medical School offers the following postgraduate courses to be given or started during the month of November, 1957:

Department of Medicine

Problems in Clinical Medicine.—A part-time course 9 a.m. to 12 m., Fridays, November 1 through April 25. Under the direction of Dr. Jack Nelson. Tuition \$75.00.

Fundamentals of Clinical Electrocardiographic Interpretation.—A part-time course of sixteen sessions, 7 to 9 p.m., Wednesdays, November 6 through March 5. Under the direction of Dr. J. Marion Bryant. Tuition \$50.00.

Arthritis and Allied Rheumatic Disorders.—A full-time course, November 11 through 15. Under the direction of Dr. Edward F. Hartung. Tuition \$85.00.

Electrocardiography.—A full-time course, November 11 through 15. Under the direction of Dr. J. Scott Butterworth. Tuition \$85.00.

This course is repeated, March 17 through 21, 1958.

Hematology.—A full-time course, November 11 through 15. Under the direction of Dr. Leo Weiner. Tuition \$85.00.

Diabetes Mellitus, Hyperinsulinism, and Hypoglycemia.—A full-time course, November 11 through 13. Under the direction of Dr. Benjamin I. Ashe. Tuition \$40.00.

Peripheral Vascular Diseases.—A full-time course, November 18 through 22. Under the direction of Dr. A. Wilbur Duryee. Tuition \$55.00.

Department of Obstetrics and Gynecology

Culdoscopy.—The course consists of three two-hour periods, 1 to 3 p.m., Monday, Wednesday, and Friday, November 25 through 29. Under the direction of Dr. Wayne H. Decker. Tuition \$55.00.

This course is repeated January 27 through 31, and April 28 through May 2, 1958.

Department of Ophthalmology

Ophthalmoscopy.—A part-time course, 9 a.m. to 12 m., November 4 through 8. Under the direction of Dr. George N. Wise. Tuition \$55.00.

Department of Otorhinolaryngology

Endaural Surgery.—A full-time course, November 4 through 16. Under the direction of Professor John F. Daly. Tuition \$250.00.

This course is repeated, January 27 through February 7, 1958.

Department of Pediatrics

Review of Clinical Pediatrics.—A full-time course, November 18 through 23. Under the direction of Professor Adolph G. De Sanctis. Tuition \$55.00. This course is repeated, February 17 through 22, 1958.

Pediatric Endocrinology and Related Metabolism.—A four-day course, 9 a.m. to 4 p.m., November 11 through 14. Under the direction of Dr. Beatrice Bergman and Dr. Herbert S. Kupperman of the Department of Medicine. Tuition \$85.00.

The following postgraduate courses will be given or started during the month of December, 1957:

Department of Medicine

Gastroscopy and Flexible Tube Esophagoscopy.—A part-time course of three months' duration, 10:30 to 1:30 a.m., Mondays, Wednesdays and Fridays, December 2. Under the direction of Dr. Edwin Boros. Tuition \$300. This course is repeated March 3, 1958.

Recent Advances in the Diagnosis and Treatment of Poisonings.—A full-time course, December 2 through 4. Under the direction of Dr. Abraham W. Freireich. Tuition \$60.00.

Department of Obstetrics and Gynecology

Infertility.—A full-time course, December 2 through 4. Tuition \$45.00.

Department of Ophthalmology

Surgery of the Cornea.—A full-time course, December 2 through 6. Under the direction of Dr. Ramon Casoviejo. Tuition \$200.00.

Department of Otorhinolaryngology

Endoscopy: Bronchoesophagology and Laryngology.—A full-time course, December 2 through 14. Under the direction of Professor John F. Daly. Tuition \$200.00.

Department of Pediatrics

Pediatric Cardiology.—A full-time course, December 2 through 6. Under the direction of Dr. Martin M. Maliner. Tuition \$55.00.

CONTROL OF TUBERCULOSIS

(Continued from Page 733)

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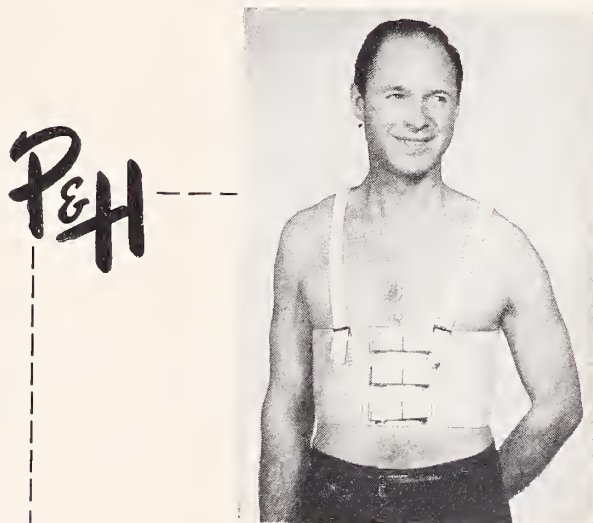
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4. Health Department clinics
5. Nursing convalescing homes for aged
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In Memoriam

WALTER WALLACE COVELL

Dr. W. W. Covell, St. Peter physician and surgeon, died September 17, 1957. He was seventy-six years old.

Dr. Covell had been practicing physician and surgeon for fifty-one years, thirty-seven of which were spent in the St. Peter community.

He was a graduate of Barnes Medical College in St. Louis, Missouri, and did postgraduate work at Poly-Clinic in New York City, New York.

Dr. Covell served with the United States Armed Forces in World War I.

His memberships include the William R. Witty Post 37 of the American Legion, Nicollet Lodge No. 54 A.F. & A.M., St. Peter Chapter No. 22 Royal Arch Masons, Ivanhoe Commandery No. 31 Knights Templar of St. Peter, and Zuhrah Temple of Minneapolis. Dr. Covell also belonged to the Nicollet-Le Sueur County Medical Society and the Minnesota State Medical Association.

Surviving him are his wife, Loretta; a son, Wallace; a daughter, Mrs. James Weisgerber; four grandchildren, Melanie and Kathy Covell, Mary and Ann Weisgerber; and two brothers, Rev. H. E. Covell of St. Petersburg, Florida, and Mr. Orson Covell of North Platte, Nebraska.

GERALD DIORA GUILBERT

Dr. Gerald D. Guilbert, a tuberculosis specialist at Fort Snelling Veterans Administration Hospital, died August 23, 1957. He was sixty-one years old.

Dr. Guilbert was graduated from the University of Minnesota School of Medicine in 1927. He served at VA hospitals in Tucson, Arizona; Asheville, North Carolina; Fort Bayard, New Mexico; Livermore, California; Milwaukee, Wisconsin; Kerrville, Texas; and Waukesha, Wisconsin.

His memberships include Acacia, Phi Beta Pi, American Trudeau Society, American College of Chest Physicians, and University Masonic Lodge 316.

Dr. Guilbert also belonged to Camp Release County Medical Society, Minnesota State Medical Association and American Medical Association.

Surviving him are his wife, Cornelia; a daughter, Mrs. George Eckstein, Santa Monica, California; a brother, Oliver, Gila Bend, Arizona; and a sister, Mrs. Alan Hardy, Escondido, California.

HAROLD IRVING LILLIE

Harold I. Lillie, former staff member of the Mayo Clinic and well-known specialist in diseases of the ear, nose and throat, died August 27, 1957. He was sixty-nine years old.

A native of Grand Haven, Michigan, Dr. Lillie re-

ceived his medical education at the University of Michigan, from which he graduated in 1912. He took his postgraduate work at the University of Minnesota Hospitals.

In 1917, Dr. Lillie joined the staff of the Mayo Clinic and remained there until he retired in 1953. He was president of the American Rhinological, Laryngological and Otological Society in 1939, and of the American Laryngological Society in 1945.

Dr. Lillie was also a member of the Southern Minnesota Medical Association, the Minnesota State Medical Association, Minnesota Academy of Ophthalmology and Otolaryngology, American Otological Society, American Academy of Ophthalmology and Otolaryngology, American Alumni Association of the Mayo Foundation, American Medical Association, Alpha Omega Alpha, medical honor society, Sigma Xi and Phi Beta Pi, professional medical fraternity. He was a life member of the University of Michigan Union and a fellow of the American College of Surgeons and of the International College of Surgeons.

Surviving him are his wife, the former Oda Kittredge; a son, Dr. John C. Lillie, Mayo Clinic, Rochester; a daughter, Mrs. Thomas C. Wilder, Spokane, Washington; nine grandchildren, and a brother, Hugh E. Lillie, Grand Haven, Michigan.

ROBERT FULLER MEARS

Dr. Robert F. Mears, a Northfield, Minnesota, physician, choked to death while on a cruising barge near Cannon Falls, Minnesota, August 26, 1957. He was forty-six years old.

Dr. Mears was born in St. Paul and obtained his medical education at the University of Minnesota. He interned at Minneapolis General Hospital before starting his practice in Northfield in 1940.

He was a member of the staff of Northfield City Hospital, Rotary Club, Masons, I.O.O.F., Rice County Public Health Nursing Board, Rice County Medical Society, Southern Minnesota Medical Society, Minnesota State Medical Association and American Medical Association.

Dr. Mears was also a physician and surgeon for the Northfield Foundry and Machine Company and Campbell Cereal Company of Northfield, a deacon at the Congregational-Baptist Church, past president of the Junior Chamber of Commerce, past president of the Northfield Golf Club, and past director of the Red Cross Regional Blood Bank.

Survivors include his wife, Helen; one son, Robert, fifteen; a daughter, Barbara, fourteen; one sister, Mrs. Gertrude Ogden, Orinda, California; and five brothers, Norman B., William E., and Dr. Burtis J. of St. Paul, Minnesota; C. Plin of Keokuk, Iowa; and Dr. Hiram E. of Menlo Park, California.

IN MEMORIAM

MUEL SAMUELSON

Dr. Samuel Samuelson, Robbinsdale physician, was killed August 25, 1957, when his small plane crashed near Tofte, Minnesota. His two sons, Paul, eight, and Edna, seven, were also killed in the accident.

He was born in Milwaukee, Wisconsin, and obtained his medical education at the University of Minnesota. Dr. Samuelson was the founder of Victory Memorial Hospital, now North Memorial Hospital.

He was a member of Hennepin County Medical Society, Minnesota State Medical Association, and the American Medical Association.

Surviving Dr. Samuelson are his wife, Edna; three daughters, Mrs. Phyllis Peterson, Nancy and Janet, all of Minneapolis, Minnesota; one sister, Mrs. Anna Anderson, Chicago, Illinois, and a brother, Arnold Samuelson, Fort Worth, Texas.

ARTHUR CLARENCE STRACHAUER

Dr. Arthur C. Strachauer, retired physician and surgeon, died August 23, 1957, in Minneapolis, Minnesota, at the age of seventy-four.

Dr. Strachauer was born and raised in Minneapolis. He received his medical degree at the University of Minnesota and took graduate training at the University of Wisconsin. In 1911, he joined the surgery staff of the University of Minnesota as an instructor, and in 1918 became head of the surgery department. He was also

director of the University Cancer Institute and co-founder of the Nicollet Clinic.

In 1930, he resigned to devote full time to private practice, in which he was chief surgeon for the Soo Line Railroad. He retired in 1943.

Dr. Strachauer was a member of the Hennepin County Medical Society, the Minnesota State Medical Association, American Medical Association, Western Surgical Society, Delta Kappa Epsilon, Nu Sigma Nu, Minneapolis Club and the Lake Francis Gun Club.

He was also a fellow for life in the Minneapolis Art Institute and a life member of the Minnesota Historical Society.

Dr. Strachauer is survived by his wife; a son, Hermann, and four grandchildren.

SOFUS E. URBERG

Dr. Sofus E. Urberg, former chief of staff of St. Mary's and St. Luke's Hospitals in Duluth, Minnesota, died August 23, 1957. He was fifty-nine years old.

Born in Blair, Wisconsin, he attended Concordia College in Moorhead, Minnesota, and the University of Minnesota Medical School.

Dr. Urberg was very active in civic affairs and was a former director of the Department of Health of the Duluth Public Schools System. He was a member of the U. S. Army Reserve Corps, and was recalled to active duty with a National Guard unit in 1941. At that time, he served as a physician and interpreter for Norwegian ski troopers in Denver, Colorado.

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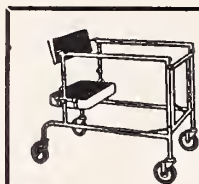
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His memberships include the David Wisted P. American Legion; Scottish Rite bodies, Aad Tem Shrine, Order of Eastern Star, Harriet Chapter; Nor Lodge, Sons of Norway; St. Louis County Med Society, Minnesota State Medical Association, and American Medical Association. He was past master of Ic Lodge No. 186 AF&AM, and physician for the Daughters of Norway.

Dr. Urberg is survived by his wife, Doris; two sisters, Mrs. Chester Anderson, Belgrade, Minnesota, and Mrs. O. G. Malmin, Minneapolis, Minnesota; two brothers, Rev. Conrad Urberg, Blair, Wisconsin, and Rev. Sig Urberg, Mahnommen, Minnesota.

ROSCOE CLAYTON WEBB

Dr. Roscoe C. Webb, chief surgeon of the Great Northern Railway, died August 16, 1957, in Minneapolis. He was sixty-seven years old.

Dr. Webb was a clinical associate professor of surgery at the University of Minnesota and a member of the staffs of Northwestern, Asbury Methodist, and Abbott hospitals.

A native of Amiret, Minnesota, he received his B.S. degree from the University of Minnesota and was a 1919 graduate of Johns Hopkins University School of Medicine.

Dr. Webb took his postgraduate work at Rockefeller Institute in New York and Harvard Medical School in Boston. He then spent two years in France and Germany with the American Expeditionary Forces. He became division surgeon of the Great Northern Railway in 1922 and was appointed chief surgeon in 1926.

A member of the Hennepin County Medical Society, Dr. Webb also belonged to the Minnesota State Medical Association, where he served as chairman of the Association's Committee on Fractures for many years, the American Medical Association, Johns Hopkins Surgical Society and was a presiding officer of the Minneapolis Academy of Medicine.

Survivors include his wife, Edith; two sons, Dr. Roscoe C., Jr., Los Angeles, California, and Dr. Robert I. Webb, Houston, Texas, and T. R. Webb, Paris, France.

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Woman's Auxiliary

AUXILIARY LEADER DIES

Auxiliary women throughout the state are saddened by the death, August 19, 1957, of Margaret Scheman Wahlstrom, our beloved friend and leader. Margaret knew of illness for seven years before her death and accepted knowledge with courage and a determination to live every remaining day count. Her minister, the Reverend Howard Conn said, "She put a lot of living into everything she did, even into the last years of her illness. To the end, her courageous faith made her triumph over the ravages of disease."

She loved people and she wanted life to be better for people. She was a leader in many organizations, the Hennepin County Tuberculosis Association, the Red Cross, Minnesota rehabilitation work, the Y.W.C.A., Washburn Congregational Church, Washburn P.T.A., Carleton College Alumni Association, the University of Minnesota Faculty Club, and the Tourist Club. She organized the first cancer control program in Minneapolis and was a member of the state board of the American Cancer Society. And she was the first woman member of the United States committee of the World Medical Association.

Margaret's great work was done in furthering the needs of her husband's profession. She began in her county auxiliary and progressed through the state presidency to the highest office in the organization, the national presidency. Her year as state president was one of innovation: the publication of our first newsletter, health days, our first school of instruction, the relaying of medical information to lay organizations.

Her leadership qualities were exceptional, and she had the gift of inspiring enthusiasm in all who worked with her. We shall miss her radiant and lovable presence, her powerful voice, her sure judgments.

Surviving her are her husband, Dr. Harold F. Wahlstrom; her parents; two daughters, Mrs. Raymond Asp and Mrs. Joseph Husbands of Minneapolis; son, Harold, who is a student at Carleton College, and three grandchildren.

Her minister summed up her life when he said, "As a daughter, sister, wife, mother and friend, she was everything that could be desired."

Contributions for this column, including news and activities of state auxiliary societies and items of interest to members, may be sent to Mrs. A. B. Rosenfield, Woman's Auxiliary Editor, MINNESOTA MEDICINE, 2920 Franklin Boulevard, Minneapolis, Minnesota.

MEET YOUR 1957-1958 COUNTY PRESIDENTS

(Please Save for Reference)

Becker: Mrs. W. C. Dodds, Detroit Lakes

Blue Earth: Mrs. Edgar E. Heller, 1038 E. Main St., Mankato

Blue Earth Valley: Mrs. H. H. Russ, Blue Earth

Brown: Mrs. C. A. Saffert, 509 S. Washington, New Ulm

Camp Release: Mrs. R. W. Barr, 815 Grove, Montevideo

Clay: Mrs. James W. Duncan, 505 8th St. S., Moorhead

East Central Minnesota: Mrs. E. G. Hubin, Sandstone

Freeborn: Mrs. A. K. Sherman, 601 Ruble Ave., Albert Lea

Goodhue: Mrs. Ezra V. Bridge, Mineral Springs Sanatorium, Cannon Falls

Hennepin: Mrs. Karl W. Anderson, Linwood Rd., Excelsior

Kandiyohi-Swift-Meeker: Mrs. Walter E. Hinz, 319 W. 6th St., Willmar

Lyon-Lincoln: Mrs. J. W. Myers, Canby

McLeod: Mrs. M. M. Howell, 705 West 9th St., Glencoe

Mower: Mrs. Wallace Anderson, 607 Prospect, Austin

Nicollet-Le Sueur: Mrs. V. A. Schulberg, Gaylord

Park Region: Mrs. L. T. O'Brien, Breckenridge

Ramsey: Mrs. H. J. Wolff, 2245 Stanford Court, St. Paul

Range: Mrs. R. E. Barnes, Aurora

Red River Valley: Mrs. W. M. Feigal, Thief River Falls

Renville-Redwood: Mrs. Jack F. Haas, Fairfax

Rice: Mrs. George N. Rysgaard, 420 Oak St., Northfield

St. Louis: Mrs. R. C. Pedersen, 2419 E. 2nd St., Duluth

Scott-Carver: Mrs. David Philp, Watertown

Southwestern Minnesota: Mrs. Harold Christiansen, Jackson

Stearns-Benton: Mrs. C. F. Brigham, Jr., 1259 7th Ave. N., St. Cloud

Steele: Mrs. D. K. Halvorsen, 605 S. Cedar, Owatonna

Upper Mississippi: Mrs. Robert L. Pedersen, 418 Cedar, Brainerd

Wabasha: Mrs. John Flatt, Wabasha

Waseca: Mrs. R. D. David, Waseca

Washington: Mrs. J. E. Jenson, 1317 Hillcrest, Stillwater

West Central Minnesota: Mrs. Gordon Lee, Glenwood

Winona: Mrs. Carl Heise, 153 W. 7th St., Winona

Wright: Mrs. W. H. Thomas, Howard Lake

Zumbro Valley: Mrs. W. E. Wellman, 1127 Plummer Circle, Rochester

General Interest

"The Concept of Early Diagnosis in Cerebrovascular Disease" was the subject of a paper presented on September 10 at the Minnesota Society of Neurology and Psychiatry by **Dr. Robert G. Siekert**, Rochester.

* * *

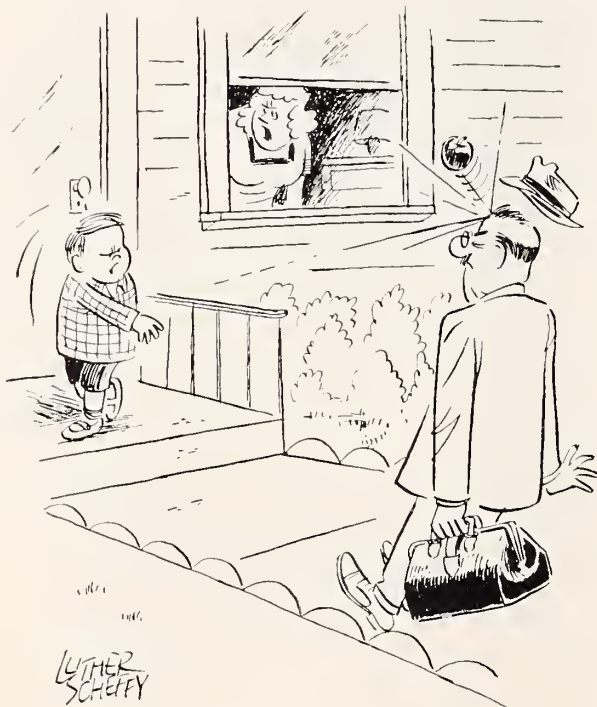
Dr. John J. Regan, Minneapolis, presented a paper on "Psychiatry in a Multi-racial Community" at the regular meeting of the Minnesota Society of Neurology and Psychiatry, in Saint Paul, September 10.

* * *

Dr. Donald Olmanson, a 1956 graduate of the University of Minnesota Medical School, is now associated with his father, **Dr. E. G. Olmanson**, in the St. Peter Clinic in St. Peter. While in medical school, **Dr. Olmanson** did research work in rheumatic fever and other heart ailments.

* * *

Two physicians, who recently joined the staff of the East Range Clinic in Virginia, are **Dr. Isaac M. Prlina**, and **Dr. George B. Ewens**. **Dr. Prlina**, a specialist in urology, is a 1952 graduate of the University of Minnesota School of Medicine, and interned at the Long Beach, California, Veterans' Hospital. **Dr. Ewens**, a dermatologist, is the son of the late **Dr. Harry B. Ewens**, one of the founders of the East Range Clinic.



"JUNIOR! THAT'S NOT THE WAY THE APPLE'S SUPPOSED TO KEEP THE DOCTOR AWAY!"

Dr. James Pluth is now on the staff of the Mesa Clinic in Chisholm. **Dr. Pluth** was a graduate of University of Minnesota Medical School and has completed his internship at Cleveland City Hospital, Cleveland.

* * *

Col. J. R. Shaeffer, consultant on Medical Care Disaster at Walter Reed Army Institute of Research, spoke at a Mayo Clinic staff meeting on September 4 at the Mayo Civic Auditorium.

* * *

Dr. E. R. Chappell has recently joined the staff of the Stillwater Clinic as a specialist in surgery. **Dr. Chappell** is a graduate of the medical school of the University of Nebraska, and during the past four years has held a residency in general surgery at Louisville, Kentucky, General Hospital.

* * *

Dr. N. W. Barker, Mayo Clinic, Rochester, was among forty speakers at the Minnesota Heart Association fourth biennial symposium, "Peripheral Vascular Disease," held September 23-25 at the clinic. **Dr. Barker's** subject was "Anti-Coagulant Drugs in Therapy."

* * *

An open house in honor of **Dr. and Mrs. Richard Engwall** was held August 11 at Ivanhoe. **Dr. Engwall** was the winner of the first Rural Medical Scholarship awarded by the Minnesota State Medical Association, and also the first scholarship recipient to begin practice in the state of Minnesota. In accordance with the scholarship agreements, **Dr. Engwall** will practice in a rural community of 5,000 or less population in Minnesota for a period of at least five years. He has already opened his practice. Three other recipients are still at the University of Minnesota Medical School and a fourth will be chosen from applicants for the scholarship this fall.

* * *

NBC radio's "Monitor" recently featured **Dr. Robert N. Barr**, Secretary and Executive Officer of the Minnesota State Board of Health. **Dr. Barr** discussed Asian influenza.

* * *

Drs. D. C. Dahlin and **P. R. Lipscomb** attended the congress of the International Society of Orthopedic Surgeons in Barcelona, Spain, September 16 through 21.

* * *

Dr. John C. Wohlrabe, who has been in general practice at St. Clair, has set up a general medical practice at Mankato in the space formerly occupied by the late **Dr. H. J. Nilson**. **Dr. Wohlrabe** is the son of **Dr. C. F. Wohlrabe**, also of Mankato.

* * *

Dr. A. Hartwell Jewell, a graduate of Northwestern University School of Medicine, has recently joined the staff of the Austin Clinic, Austin, Minnesota, where his practice will be limited to surgery.

(Continued on Page A-60)

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(Continued from Page A-58)

Dr. K. L. Nelson, Warroad physician for the past six years, will soon begin his new duties as Student Health Officer at Texas A & M College.

* * *

Dr. Richard E. Student, a graduate of the University of Minnesota School of Medicine, has joined the staff of the East Range Clinic and will be associated with **Drs. John L. Bonner** and **F. R. Kotchevar** at the Clinic's offices in Eveleth.

* * *

Among the newly approved grants and appropriations announced by the National Foundation for Infantile Paralysis is an award to the University of Minnesota in the amount of \$87,761, to continue studies of human cell lines growing in tissue culture. This is part of a program of awards totaling \$4,527,064.

* * *

One of the winners in the 1957 prize essay contest sponsored by the American College of Chest Physicians was a University of Minnesota Medical School student, **Stephen A. Kieffer** was awarded third prize and a case award of \$200 in the international contest for his paper on "Atrial Septal Defect: An Evaluation of Surgical Closure."

* * *

Dr. Warren J. Brooker has left his practice in Duluth to take a postgraduate course in surgery and urology at the Veterans Administration Hospital in Minneapolis. **Dr. W. A. Stein** has assumed **Dr. Brooker's** practice at 4107 Woodland Avenue.

* * *

Dr. Kenneth E. Ahola, of Hibbing, was married to Miss Helen Bonvicin of Hibbing in June.

* * *

Dr. Malcolm McCannel, Minneapolis, was guest speaker at the August 27 meeting of the Range Medical Society at Grand Rapids, Minnesota.

* * *

Dr. John F. Briggs, Saint Paul internist, moderated the high blood pressure section of the Symposium on Diagnosing and Treating Peripheral Vascular Disease presented by the Minnesota Heart Association at a meeting held in Rochester, September 23-25, 1957. His guest speakers included: **Dr. James Culbertson**, University of Iowa; **Dr. Stefan Fajans**, University of Michigan; **Dr. John H. Moyer**, Philadelphia; **Drs. Ray Gifford**, **Walter Kvale**, **William Manger** and **Grace M. Roth** of the Mayo Clinic, Rochester.

* * *

Dr. André M. Bruwer, specialist in diagnostic roentgenology and member of the staff of the Mayo Clinic, Rochester, since 1952, left Rochester October 1 to continue the practice of his specialty in Tucson, Arizona.

* * *

Dr. C. W. Mayo, Mayo Clinic, Rochester, spoke at a session of the National Medical Association in Cleveland, Ohio, in August.

* * *

Dr. John A. Seaberg was recently featured as one of the Minneapolis Star's "Town Toppers." He retired as manager of Veterans Hospital in Minneapolis in September. **Dr. Seaberg** will be succeeded by **Dr. Henry L. Vogl**, Milwaukee, Wisconsin.



SCHEFFY

"MIND IF I LOOK OVER YOUR SHOULDER WHILE YOU WORK?"

Dr. D. H. Bessen, who has practiced in Olivia since 1953, gave up his practice in that community on September 1 to accept a position at the Grand Canyon National Park Hospital in Arizona.

* * *

The Minnesota Heart Association honored **Dr. James A. Cosgriff, Sr.**, for service as the 1956 president of the voluntary health agency. During his term, the Heart Association gained a 22 per cent increase in income, enabling substantial expansion of heart research, education, and community service program.

* * *

Dr. Waltman Walters, Rochester, was the recipient of an alumni award presented by Dartmouth College in September. He was one of eighteen candidates nominated by their 28,000 fellow alumni. The selection was based on service to nation, state and community, professional success, and service to Dartmouth. **Dr. Walters** is professor of surgery at the Mayo Foundation in Rochester.

* * *

The Minnesota Heart Association's annual Heart Council Seminar, September 7, 1957, featured **Dr. John B. Moyer**, Duluth internist. **Dr. Moyer's** topic was "Community Education in Rheumatic Fever."

* * *

Dr. Nathan K. Jensen spoke on "Surgery in Tuberculosis," September 11, 1957, to members of the third district of Minnesota Nurses Association at Glen Lake Sanatorium.

* * *

Dr. Roger S. Johnson has taken a leave of absence from his duties at Minnetonka Clinic, having been

and a Fellowship by the University of Minnesota in the field of surgery.

* * *

Dr. Philip H. Soucheray, chief of Ancker Hospital and X-Ray Clinic, spoke on the Mantoux tuberculosis test at a meeting of women Christmas Seals volunteers at White Bear Lake, September 4, 1957.

* * *

Five physicians are among ten committee chairmen who will head the Minnesota Heart Association's 1957-58 programs. They are: Dr. Arthur C. Kerkhof, Minneapolis, Community Service; Dr. Maurice B. Visscher, University of Minnesota, Research Allocations; Dr. Robert A. Good, University of Minnesota, Rheumatic Fever; Dr. John Briggs, St. Paul, Professional Education; and Dr. J. J. Eustermann, Mankato, Membership. The Association's executive committee is made up of the committee chairmen.

* * *

The eleventh annual Minnesota Public Health Conference was held September 19-20, 1957, in Minneapolis. The Albert J. Chesley Memorial Lecture was delivered by Dr. John W. Knutson, assistant surgeon general of the United States. Dr. Knutson discussed "Contraception in Public Health."

* * *

A panel discussion, "News in the Hospitals," was presented at the fall meeting of the Minnesota Association of Hospitals, September 14, 1957. Dr. C. L. Oppegard, Rockton, Chairman of the Council of the Minnesota State Medical Association, represented the medical profession in the panel discussion. Other participants were: Dr. Wood, St. Paul, president of the Twin Cities Hospital Administrators Association, and John Bach, Chicago, public relations staff of the American Medical Association.

* * *

Dr. John Briggs, St. Paul, Tuberculosis Committee Chairman of the Minnesota State Medical Association, and Dr. J. A. Myers, University of Minnesota, were among the speakers at the two-day conference for volunteer tuberculosis workers at the Christmas Seal headquarters in St. Paul the latter part of August.

* * *

Dr. Earl Hill, University of Minnesota, was recently promoted from clinical instructor in the Department of Medicine, to clinical assistant professor.

* * *

The Veterans Administration (VA) area medical office at Fort Snelling will be transferred to Omaha, Nebraska, shortly after the first of the year. The move is a result of a plan for geographic realignment for providing more efficient administration. Dr. E. C. Andersen is director of the Fort Snelling area office composed of twenty-seven employees. This office supervises VA medical affairs in nine Midwest states.

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MINNESOTA BLUE SHIELD-BLUE CROSS

On November 1, 1957, Minnesota Blue Shield will complete its first ten years of operations as a voluntary, nonprofit, prepayment medical service plan. The Plan's progress, its acceptance by the public, and the amount of subscribers' benefits paid for doctors' services during this decade are worthy of review and consideration.

In slightly less than ten years of operation Blue Shield has increased benefits for over 200 items in the fee schedule and has added to the contract and fee schedule such services as consultation, emergency and intensive in-hospital medical care, electroshock therapy in psychiatric cases, and x-ray therapy and radioactive isotope services for certain diseases and conditions. A new, higher benefit, higher service income plan (Plan B) was made available to subscribers in March, 1954.

Enrollment-wise, Minnesota Blue Shield has grown from a plan of 6,500 participant subscribers at the end of 1947, to one of over 855,000 participant subscribers at the end of July, 1957, and currently ranks 12th among Blue Shield Plans of the United States.

From Minnesota Blue Shield's beginning through the month of July, 1957, approximately \$37,000,000 has been paid for physicians' services rendered to participant subscribers, and the Plan is currently providing benefits at the rate of over \$8,000,000 per year.

Each year the Blue Cross role in the health care of Minnesotans becomes increasingly important.

As of July 1, 1957, 1,127,226 Minnesotans were protected by Blue Cross coverage, a six per cent increase over the same period last year.

During the first seven months of 1957, 118,872 Blue Cross members used 722,512 days of hospital care, amounting to benefits totaling \$16,486,148. This was an increase of approximately \$3,000,000 over the same period of a year ago. During the same seven months period in 1952, Blue Cross payments totaled \$7,341,450.

The increase in enrollment during the last five years is further illustrated by the fact that as of July 31, 1952, there were 1,002,036 Minnesota Blue Cross participant subscribers, as compared to 1,127,226 in 1957.

During the period from July, 1952, to July, 1957, Blue Cross benefits available have been continually extended. The range of room and board allowances available have increased from \$9 to \$20.

The comprehensive Blue Cross contract providing full payment for semi-private rooms, and the average multi-bed charge of the hospital toward private room accommodations, has now been initiated by many large corporations in Minnesota. Under this same comprehensive contract, it is now possible to extend the number of days of hospital coverage to as many as 730.

During this five-year period from July, 1952, to 1957, several additional benefits have been added to Blue Cross contracts in keeping with the progress of new hospitalization-medical-surgical techniques.

One of the most recent increases in Blue Cross benefits was the extension of the number of days of coverage for tuberculosis, nervous and mental care from thirty days to the number of days covered under the basic contract which could amount to as many as 730 days in Blue Cross hospitals having proper facilities.

Book Reviews

Books listed here become the property of the Ramsey Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

MODERN PERINATAL CARE. Leslie V. Dill, M.F.A.C.S. Diplomate of the American Board of Obstetrics and Gynecology; Associate Clinical Professor of Obstetrics and Gynecology, Georgetown University School of Medicine; Consultant, Obstetrics and Gynecology, Army Medical School and Walter Reed General Hospital; Staff Member, Obstetrics and Gynecology, Providence Hospital, Washington, D. C. 464 pages. Illus. Price \$6.50. cloth. New York: Appleton-Century-Crofts, Inc., 1957.

VASCULAR SURGERY IN WORLD WAR II. Edited by D. C. Elkin and M. E. DeBakey, Medical Department, United States Army. 464 pages. Illus. Price \$4.25. Washington, D. C.: U. S. Printing Office, 1957.

To the surgeon in civilian practice, a case of acute vascular trauma is an uncommon incident, and thus the handling of hundreds of such limb- and life-endangering situations staggers his comprehension. In this volume, however, is compiled the mass experience of surgeons treating the vascular injuries during and after World War II. In an undramatic fashion, the authors present an exhaustive review of these observations.

Because of its extended statistical approach, this is a formidable book to read, but accompanying the analysis are many detailed references and explanations in the light of past and present knowledge which provide insight to the problems and their treatment.

The section on evaluation of vascular status is especially informative. Although much of this evaluation requires apparatus unavailable in most private hospitals, less complex methods of appraisal are also discussed and their application assayed in light of the authors' experience.

The discussion of arterial aneurysms and arterio-venous fistulae is particularly detailed, and the results have been carefully scrutinized by the authors, making this portion of the text a well-documented exploration of these two important problems. Sympathectomy as a preoperative and postoperative adjunct to therapy is also discussed at profitable length.

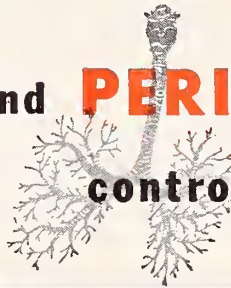
The text is sprinkled liberally with concise case reports illustrating some of the fundamental aspects of traumatic vascular repair and their complications.

This is not a text for casual browsing but will provide the student of this subject with basic knowledge. Drawn from a wide and, it is hoped, a unique experience.

J.V.T.

LEAFLETS ON CARE OF CHILDREN'S EYES

The Philadelphia Association for the Blind announces the publication of three new leaflets particularly pointed toward the care of children's eyes: "Cross-Eyes," "Check Your Child's Eyes," and "What's the Score on Your

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ants' Eyes?." These leaflets have been designed to complement a complete program in the greater Philadelphia Area during September, October and November... themed to the slogan of "Regular Eye Examination Today"—"Healthy Eyes for Tomorrow." Parents especially urged during these months to have their children's eyes examined regularly and they are cautioned to watch for these six warning danger signs in their children's eyes: cross-eyes; headaches and nervousness; red, watery, itchy eyes; rubbing eyes often; squinting when looking at objects; holding head to one side. Other leaflets published by the Philadelphia Association for the Blind are: "The Eye in High Blood Pressure;" "Truth About Eye Surgery;" "Eye Accidents;" "Diabetes Can Cause Blindness;" "What Is a Cataract?"; "Why Glasses?"; "Danger Ahead—Glaucoma"; "Blindness Doesn't Just Happen;" "The Philadelphia Association for the Blind;" "Handle With Care"; "Take Care to See!".

Individuals and organizations wishing sample copies of these leaflets may write to: Philadelphia Association for the Blind, 100 East Price Street, Philadelphia 4, Pa. Attention: Prevention of Blindness Department.

NEW MEDICAL JOURNAL LAUNCHED

The American Rheumatism Association is pleased to announce the forthcoming publication of a new medical journal—*Arthritis and Rheumatism*, the official journal

of the American Rheumatism Association. Grune & Stratton, Inc., New York, publishers of the journals *Blood*, *Circulation*, *Circulation Research*, *Clinical Research Proceedings*, and *Metabolism*, have been chosen by the Association to publish this new journal which will appear bimonthly starting with the January-February issue of 1958. The Association's Publication Committee is composed of Drs. Richard H. Freyberg, William H. Kammerer, John Lansbury, Charles Ragan, and Charles L. Short. William S. Clark, M.D., has been chosen to serve as Editor, and the remainder of the Editorial Board will be announced subsequently.

The journal will cover the field of connective tissue disorders, in particular, rheumatoid arthritis, osteoarthritis, rheumatic fever, gout, the so-called "collagen diseases," and nonarticular rheumatism. In the choice of original articles, the Editorial Board hopes to achieve an optimal balance between papers relating to clinical experience and those which report pertinent developments in the basic sciences, such as immunology, biochemistry, pathology, and pharmacology. In addition to original and review articles, special departments will include news and notices, correspondence, editorials, progress reports, and book reviews. The contents of the journal should interest not only the specialist in rheumatic diseases, but also the internist, orthopedic surgeon, research worker, and all practitioners with a special interest in these diseases.

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Problems in the Evaluation of Mitral Valvotomy

PAUL WINCHELL, M.D.
Minneapolis, Minnesota

DESPITE the fact that thousands of mitral valvotomies have been carried out, the value of this operation is unknown. Certain cardiovascular surgical procedures are obviously curative, such as the operations for coarctation of the aorta and patent ductus arteriosus. Other operations would appear to be curative although they must at the present time be considered as experimental, and in this group one would include closure of atrial septal defects and ventricular septal defects. Yet another group of cardiac surgical procedures can be considered as entirely experimental and as of yet undetermined value, perhaps one good example of this last group being surgery for aortic valvular disease. Mitral valvotomy seems not to fall clearly into any of the above classes, and evaluation of its present status is difficult.

In an attempt to assess properly mitral valvotomy, it would seem reasonable to consider the problem from several viewpoints. In order to understand the dynamics of mitral stenosis, it is first necessary to understand something about the dynamics of the lesser circulation in normal individuals. In evaluating any type of operation, it is obviously necessary to know something about the natural history of the disease when operation is not performed. Finally, one can consider the operative results currently available.

Some aspects of the dynamics of the normal pulmonary circulation are given in Figure 1. The most striking thing about this circuit is the relative lowness of the pressures involved, the normal mean pressure in the pulmonary artery being 15 millimeters of mercury, in the pulmonary capillary 10 millimeters of mercury, in the pulmonary vein 5 millimeters of mercury, and in the left atrium 0-5 millimeters of mercury. The gradient, or difference in pressures, between the pulmonary

artery and the pulmonary capillary is very small, being approximately 5 millimeters of mercury which is in marked contrast to the situation in the systemic circulation. It is apparent from the

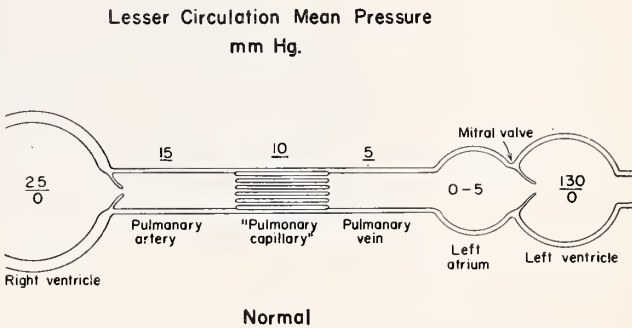


Fig. 1. Pressure relationships in the normal pulmonary circulation.

schematic presentation of lesser circulation dynamics that obstruction at the level of the mitral valve will have an effect on the dynamics of the pulmonary circulation and of the left atrium.

Intimately involved in the entire problem are the small branches of the pulmonary artery where is found the major resistance to pulmonary blood flow. A normal small pulmonary artery magnified 250 times is shown in Figure 2. The ratio of the thickness of the artery wall to the lumen of the artery is very small. In other words, there is a relatively large opening through which the blood may pass and the artery wall is relatively thin.

The dynamics of mitral stenosis in its severe form are shown in Figure 3. The data given are derived from a series of patients studied at the University of Minnesota.¹ All of these individuals were functional Class III to IV at the time of their preoperative studies. It is apparent that several changes have occurred as contrasted with the normal circulation. The most striking change is a considerable elevation of the pressures in all segments of the lesser circulation. In this group

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of six patients the pulmonary capillary pressure was found to be 34 millimeters of mercury, which is in excess of a three-fold elevation, while the pulmonary artery pressure was increased to a sim-

this group of patients the pulmonary capillary pressure of 34 millimeters of mercury closely approximates the colloid osmotic pressure of the blood plasma so that these particular patients

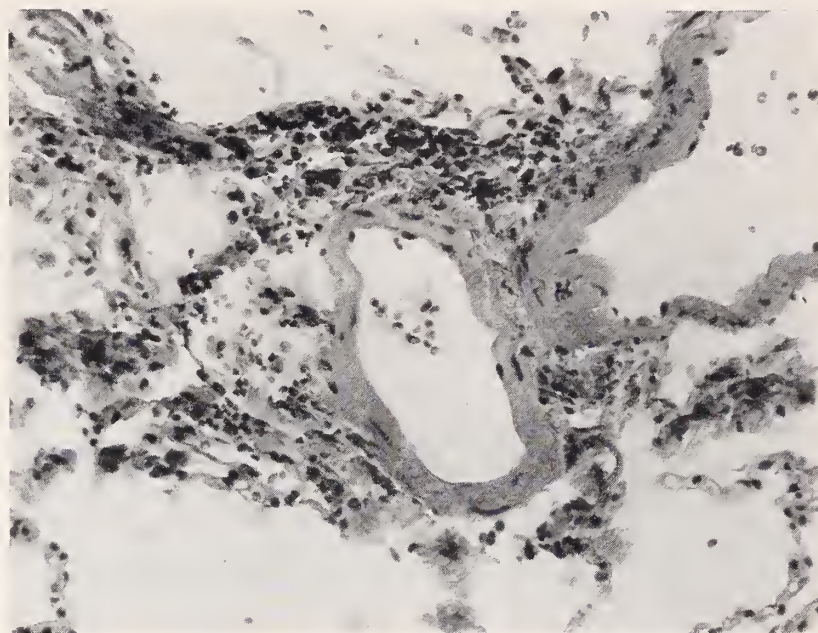


Fig. 2. Small pulmonary artery from a normal adult (X 250).

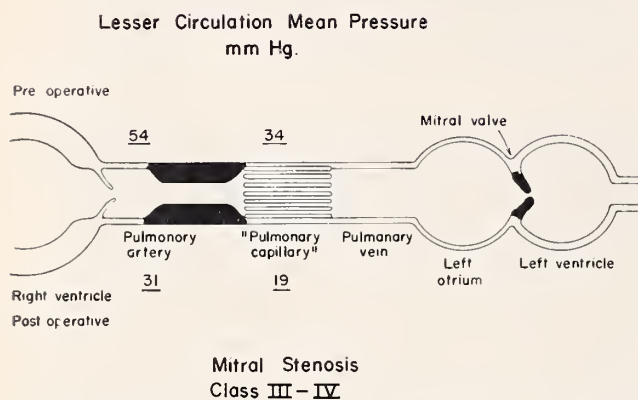


Fig. 3. Pressure relationships in the pulmonary circulation in far advanced mitral stenosis.

ilar degree, the mean value being 54 millimeters of mercury. In contrast to a gradient of 5 millimeters of mercury between the pulmonary artery and the pulmonary capillary in a normal individual, the gradient in this group of patients was approximately 20 millimeters of mercury, immediately raising a question as to the status of the small pulmonary arteries interposed between the main pulmonary artery and the pulmonary capillary which, as indicated above, are responsible for most of the resistance to blood flow through the pulmonary circuit. It is of interest that in

would appear to be on the very verge of pulmonary edema.

The fact that changes tending to increase resistance to blood flow do occur in the small pulmonary artery branches is documented by the section of a small pulmonary artery shown in Figure 4, taken from an individual dying of mitral stenosis. In comparison to the normal small pulmonary artery, there is an increase in the thickness of the wall of this vessel and a correspondingly marked diminution in the size of the lumen. The question comes up as to the effect of mitral valvotomy on such changes within the small pulmonary arteries and this question is not yet answered. Shown also in Figure 3 are the post-operative values for pulmonary artery and pulmonary capillary pressure in the same group of patients, at which time they were all classified as functional Class I and Class II. There has been a reduction in pressure, but a two-fold elevation of both pulmonary artery and pulmonary capillary pressure persists. In terms of systemic pressures this would represent a striking hypertension despite the fact that these operated patients had returned to a clinically normal functional status.

Attempts have been made to correlate the se-

verity of pulmonary hypertension with the severity of symptoms in mitral stenosis. The results of one of the earlier studies are given in Table I.² It would seem quite clear from these data that

Our knowledge of the natural history of mitral stenosis is far from complete. There are well documented instances of prolonged survival with mitral stenosis consistent with a relatively normal

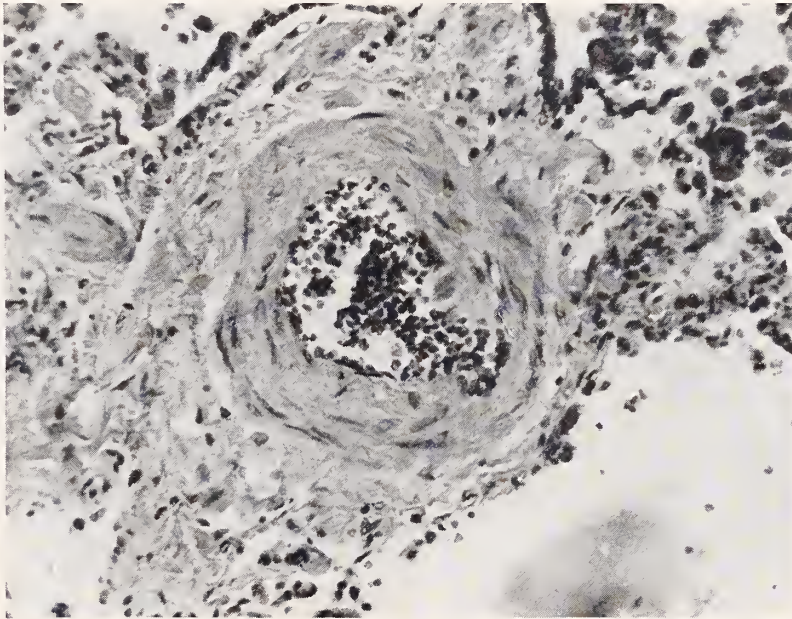


Fig. 4. Small pulmonary artery from a fatal case of mitral stenosis (X 250).

TABLE I.² FUNCTIONAL STATUS VERSUS PULMONARY PRESSURE IN MITRAL STENOSIS

Number of Patients	Functional Status	Pressure Mm. Hg.
12	Normal	20/9
17	I-II	30/16
14	III-IV	69/34

in general the more severe the mitral stenosis, the higher is the pulmonary artery pressure. Using the relationship of resistance being equal to pressure divided by flow, it is permissible to calculate a value for the total resistance to blood flow through the pulmonary circuit, the value representing or reflecting to some degree changes within the small pulmonary artery branches. In Table II¹ are given values for mean pulmonary artery pressure and total pulmonary resistance as compared to normal individuals and it is quite apparent that in this group of class III and IV mitral stenosis patients a significant elevation of the total pulmonary resistance was present, the average value being almost eight times that of the normal circulation. With this information in mind it is useful to next consider the natural history of mitral stenosis.

TABLE II.¹ PULMONARY RESISTANCE IN MITRAL STENOSIS. CLASS III-IV

Patient	Pulmonary Pressure (Mean) Mm. Hg.	Pulmonary Resistance
1.	66	1638
2.	52	855
3.	35	391
4.	37	854
5.	43	637
6.	92	3019
Average	54	1232
Normal	12	166

activity range. In Figure 5 are shown the postero-anterior and right lateral chest films of a fifty-six-year-old man in whom the diagnosis of mitral stenosis was first made in 1921. At this time, thirty-five years later, he continues to be active and is able to live an entirely normal life and to work full time as a teacher. He requires no medication. The findings at this time are typical of mitral stenosis. It would seem reasonable to assume that some, and possibly many, patients with mitral stenosis who are functional Class I or even functional Class II can live a nearly normal life. Certainly the clinical diagnosis of mitral stenosis is in itself not an indication for mitral valvotomy.

In contrast to the patient just mentioned, it

must be pointed out that people do die of mitral stenosis. In the group of fourteen Class III and IV mitral stenosis patients presented previously with pulmonary artery pressures in the neighbor-

embolization did occur in the absence of atrial fibrillation.³

What little is known about the natural history of mitral stenosis suggests that the milder form

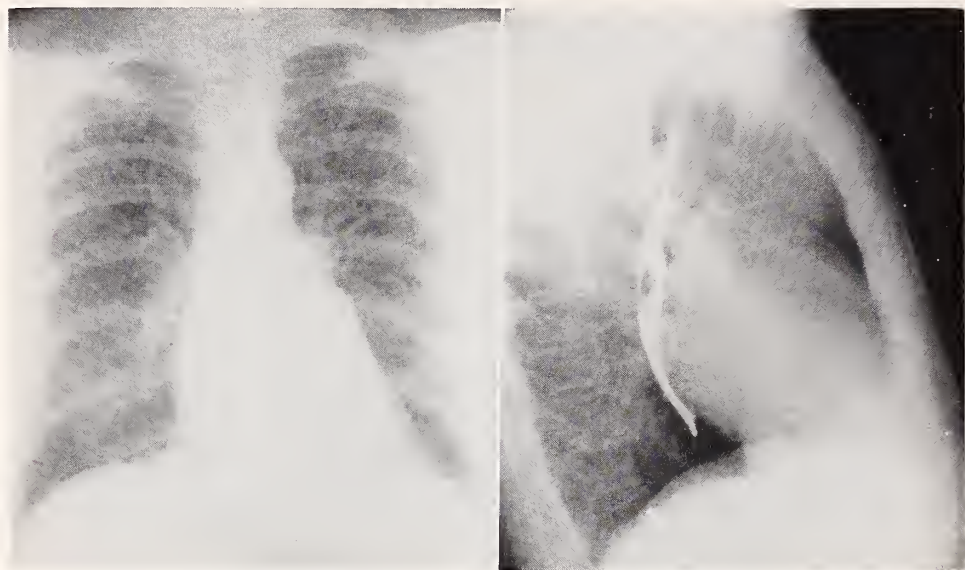


Fig. 5. Postero-anterior and right lateral views of the chest from a case of mitral stenosis of thirty-five years' duration.

TABLE III.³ FINDINGS IN 100 AUTOPSIED CASES OF MITRAL STENOSIS

Age of death for men	42.7 years
Age of death for women	38.6 years
Duration of illness from onset of congestive failure	3.5 years
Number of patients fibrillating	50 years
Number with systemic emboli	46 years

hood of 69/34 millimeters of mercury, five died within eleven months of the physiologic studies. The pressures in the five individuals who died averaged 93/45 millimeters of mercury, suggesting that the person with the higher pulmonary pressure is in more immediate danger from his mitral stenosis.²

In Table III are given data in 100 autopsied cases of mitral stenosis reported before the antibiotic era and, of course, long before the advent of mitral valvotomy. This was a highly selected group in that all came to autopsy. It is apparent that the mean age at death was relatively young, being forty-three years for men and thirty-nine years for women. The data indicate that the duration of illness after the onset of congestive heart failure was only three and one-half years, and that of the entire group fifty had atrial fibrillation. It is also of interest that forty-six of the group had systemic emboli which constitute a special problem. It was also pointed out in this study that

TABLE IV.⁴ OPERATIVE MORTALITY IN MITRAL STENOSIS

Patient No.	Class II-III		Class IV	
	No.	%	No.	%
1-100	59	14	41	32
101-200	74	3	26	27
201-300	76	7	24	21
301-500	74	2.7	26	27

Table IV is reproduced by permission from Ellis and Harken. "The Clinical Results in the First Five Hundred Patients with Mitral Stenosis Undergoing Valvuloplasty." *Circulation*: 11:4 (Apr.) 1955.

of the disease without pulmonary hypertension can be compatible with a long and active life if systemic embolization does not supervene, whereas the most severe form of the disease may prove fatal. It would seem reasonable to consider what has been accomplished by valvotomy, particularly in those people who were more severely ill and could be classified as functional Class III to IV.

Of importance to any such discussion is the problem of operative mortality and the figures from one surgical group are shown in Table IV.⁴ The mitral valvotomies are listed in groups of 100 consecutively and are further divided into functional Class II and III as opposed to Class IV patients. It is seen that since the early days of this operation the operative mortality in the less severely ill patients has progressively dropped from

MITRAL VALVOTOMY—WINCHELL

TABLE V.¹ PULMONARY PRESSURE AND RESISTANCE IN MITRAL STENOSIS—PREOPERATIVE AND POSTOPERATIVE VALUES

Patient	Pulmonary Pressure (Mean) Mm. Hg.		Pulmonary Resistance	
	Pre-operative	Post-operative	Pre-operative	Post-operative
1	66	25	1638	449
2	52	22	855	437
3	35	35	391	315
4	37	30	854	516
5	43	26	637	466
6	92	49	3019	1272
Average	54	31	1232	576
Normal	12		166	

14 per cent to approximately 3 per cent, whereas the operative mortality in Class IV patients has remained more constant and in the neighborhood of 30 per cent. Mitral valvotomy does hold a considerable risk for the functional Class IV patient. Such a patient, however, is also subject to considerable risk by the disease itself and, in any given instance, it becomes a matter of individual evaluation.

It is generally agreed that approximately 70 to 80 per cent of the operated cases will show considerable functional improvement. The remaining patients will be unimproved for various reasons, including the presence of undetected disease of other valves, reactivation of acute rheumatic fever, the occurrence of systemic emboli at the time of surgery or soon thereafter, and also by the production of excessive mitral regurgitation at the time of operation. It would seem useful to attempt to quantitate the degree of improvement in such people by studying the same factors that were studied prior to operation, such as the pulmonary artery pressure, pulmonary flow, and pulmonary vascular resistance. In Table V¹ are given the data concerning six patients mentioned previously in whom preoperative and postoperative pulmonary pressures and preoperative and postoperative pulmonary resistance values are given and compared to normal values. It is important to remember that these patients were classified as functional Class III to IV prior to operation, and at the time of their postoperative studies were felt to be functional Class I and II. Both the pulmonary artery pressure and the pulmonary vascular resistance fell, but in this group there remained an elevation of pulmonary pressure post-operatively that was at least twice that of normal, whereas the pulmonary vascular resistance post-operatively was approximately one-half of the

TABLE VI.⁵ ONE-YEAR AND THREE-YEAR FOLLOW-UP OF FORTY-FIVE PATIENTS HAVING MITRAL VALVOTOMY

Result	1 Year	3 Years
Dead	1	5
Poor	1	5
Fair	5	8
Good	17	12
Excellent	21	15

TABLE VII. FIVE-YEAR FOLLOW-UP—MITRAL VALVOTOMY FUNCTIONAL STATUS

Patient	Preoperative	1952	1956
MM	III	I	IV
CD	IV	I	IV
JB	IV	I	Dead
DS	III	Operative death Lost to follow up	
GC	III		
HB	III	III	III
FK	III	I	III
ET	III	III	III
NC	IV	II	III
DW	IV	II	IV

TABLE VIII. FIVE-YEAR FOLLOW-UP—EXPLORATION ONLY

Patient	Functional Status		
	Preoperative	1952	1956
HH	IV	III	Dead
IK	III	II	III
DH	III	III	III
BH	IV	II	*

preoperative value and roughly three times that of normal. The functional results as expressed by the patient's ability to do things did not correlate well with the physiologic findings.

In Table VI are summarized the data from a series of forty-five patients studied for a minimum period of three years following surgery.⁵ The evaluations are given at one year and at three years. There was a significant decline in good and excellent results, a significant increase in the fair and poor results, and a distinct increase in mortality. The question that remains to be answered concerns the future course of those patients still remaining in the good and excellent groups.

In December, 1952, the first fifteen patients operated on at the University of Minnesota for mitral stenosis were reported and their functional status was indicated at that time.⁶ These patients were operated on in 1950 or 1951 so that the minimum follow-up period is five years. In Tables VII and VIII are given the preoperative evaluations, the evaluation in 1952, and the evaluation in 1956. Only one patient has been lost to follow-up. It is quite evident that the functional improvement observed in 1952 has not been maintained in

1956, and that these people have now returned to their preoperative condition. One might argue that even though this is the case, these people might all be dead now if surgery had not been performed. In Table VIII are shown the data on four patients from this group who were explored and found to have too much mitral regurgitation to allow valvotomy. Of this group one has died, but he survived approximately three years. Patient DA stated that she felt considerably better following her operation although she is able to do no more than previously. She was especially gratified by the relative absence of edema which she attributed to the fact that she was never on a low sodium diet prior to surgery but followed it carefully subsequent to operation.

Patient BA is extremely difficult to evaluate. At the time of his original surgery there was too much mitral regurgitation to allow a valvotomy. He did make a striking recovery and returned from a preoperative bed-confined state to almost normal activity. This persisted for approximately six months, at which time he learned that nothing had been done at the time of operation. Following this, he once again regressed and within a few weeks was incapacitated.

Approximately two years later, he was re-examined and it was found that the cardiac murmurs had changed and suggested that he had primarily mitral stenosis. He was recatheterized and a further increase in pulmonary pressure was recorded. For that reason he was re-operated and relievable mitral stenosis was found. Subsequent to his second operation he once more returned to a functional Class I status, is now working every day, and in general is feeling well. This man represents the best clinical result from mitral valvotomy of the fifteen original cases, but in view of the improvement following his first operation, it is extremely difficult to evaluate him now.

From the information presented concerning operative follow-up, it would appear that, although in functional Class III to IV patients there may well be a prompt and gratifying remission of symptoms and improvement in the functional status, the permanence of this improvement is not known, and patients studied five years following surgery were found to be about in their preoperative condition.

It is not entirely fair to compare patients op-

erated in 1950 and 1951 with those operated on at the present time, because the performance of mitral valvotomy depends a great deal on individual surgical experience, and it would seem likely that valvotomies done today by an experienced surgeon are technically better than those early in the experience with valvotomy. Although the operation basically has not changed, much more now is known about the possibility of a recurrence of acute rheumatic fever following surgery, and, since it is now standard practice to place postoperative patients on prophylactic penicillin indefinitely, one may expect a decreased incidence of recurrent mitral stenosis. It is also possible that there has been an improvement in the selection of patients for surgery and that only those with relatively pure mitral stenosis are being operated on now, which should tend to give better surgical results. Obviously a further and detailed follow-up of the patients operated on early in the experience with mitral valvotomy is needed.

One particular group of cases deserves special attention. Embolization into systemic arteries in mitral stenosis is well known and may be catastrophic. Almost every group concerned with this particular problem has found that the incidence of systemic embolization in individuals operated on because of previous systemic embolization has been extremely low and in fact almost nonexistent. There would appear to be an added hazard of emboli occurring at the time of operation in this particular group, although such an impression might not withstand careful study of the data available. It is felt by some individuals, and probably correctly so, that the best indication for mitral valvotomy at the present time is the prior occurrence of a systemic embolus, with the idea in mind of not improving cardiac function particularly, but of preventing further emboli.

In summary, it can be stated that the functional Class I and II patients with mitral stenosis are not in need of surgical help ordinarily and that the operative mortality in functional Class IV patients is in the neighborhood of 30 per cent. Certainly, improvement does occur postoperatively in the great majority of patients subjected to mitral valvotomy, but this improvement appears to be of temporary nature in many cases so that one must consider the operation to be strictly palliative. The best indication for operation would appear to

(Continued on Page 788)

Cholesterol

A Clinical Appraisal in Relation to Coronary Artery Disease

L. RAYMOND SCHERER, M.D.

Minneapolis, Minnesota

THE PAST decade has shown an increasing interest on the part of the physiologist, physiologic chemist, pathologist, and clinician in the relationship of atherosclerosis to lipid substances in the blood. Aschoff¹ in 1924 discovered that the fatty portions of diseased arteries contained mainly cholesterol esters. Experimental studies by Anitschkow and Chalutow² demonstrated that atheromatous changes in the arteries of rabbits could be regularly induced by feeding cholesterol. Further experimental studies in rabbits, combining hypertension with feeding of cholesterol, revealed both an increased rate and degree of atherosclerosis. (Bronte-Stewart and Heptinstall³) No other animal responds in quite this manner. Ulrich⁴ in 1926 noted elevation of cholesterol in hypertensive patients as compared to normal controls. A tremendous amount of experimental study has been carried out by investigators. Gofman and his co-workers⁵ working on the lipoprotein molecule in serum with the ultracentrifuge did much to increase the general interest. Anfinsen,⁶ Gould⁷ and Page⁸ have made significant contributions. Katz and his co-workers are carrying on both clinical and physiochemical studies on a large group of patients with coronary artery disease.

We might briefly review some of the known or proven things about lipoproteins which have been established by various workers using Gofman's technique, in which the large lipoprotein molecule with the least density floats to the top. Three main classes of macromolecular lipoprotein substances are recognized. The first includes very large particles known as chylomicrons. These are found in normal lymph of the intestinal wall and are largely triglyceride substances. Their exact composition is not known. The second class is composed of beta lipoproteins of which about

25 per cent is protein and the balance cholesterol, phospholipid and triglycerides. Third, the alpha lipoproteins contain relatively more protein and less fat, and are of higher density. The last two are considered to have both structural and functional differences. It is the beta lipoprotein which probably is the most important substance in the atherosclerotic pattern. Experimental work points to the probable enzymatic control of the synthesis, transport and degradation of these substances as the basis for the understanding of their abnormal metabolism. The mechanism is as yet unknown. Anfinsen⁶ and his workers have shown that an enzyme, which they have referred to as "lipoprotein lipase," is concerned with the metabolism of these molecules and that it is activated by heparin. This enzyme is thought to exist in the tissues and plasma. The activating process of heparin is inhibited by protamine. The exact mechanism of these processes is not known, and much work must be done before it is understood.

Epidemiologic studies carried out by Keys⁹ have thrown important light on another phase. He has studied different populations with relation to the fat content of their diet, the incidence of coronary disease, and the cholesterol and beta lipoprotein content of their blood. He concluded that there were significantly lower concentrations of both cholesterol and beta lipoprotein and a lower incidence of coronary artery disease in populations with a low fat intake.

Storm and Jensen¹⁰ noted a decline in the mortality rate in diseases of the circulatory system in both males and females among Norwegians from 1941 to 1945, which coincided with severe dietary restrictions, principally foods containing fat. Following the war, the mortality rate returned to its previous level, this associated with return to a normal diet.

Not all workers interested in this subject are impressed with the lipid factor. McMillan¹¹ re-

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Statistical analysis made by Dr. Jacob E. Bearman, Department of Biostatistics, University of Minnesota.

TABLE I. INDEXES OF PER CAPITA CONSUMPTION OF MAJOR FOOD GROUPS
Five-year moving averages (1909-13=100)¹

Middle of 5-Year Period	Meat, Fish, Poultry	Dairy Products (Including Butter)	Eggs	Fats and Oils	Fruits and Vegetables	Potatoes, and Sweet- potatoes	Dry Beans, Peas and Nuts	Flour and Other Cereal Products	Sugar and Sirups	Coffee, Tea and Cocoa
1911	100	100	100	100	100	100	100	100	100	100
*	*	*	*	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*	*	*	*
1955 ²	115	116	140	200	130	52	119	70	165	151

¹ Derived from data on per capita consumption of individual foods, using estimates or retail weights multiplied by average retail price in 1947-1949. Civilian consumption only beginning 1941. Each figure is a five-year average covering the period two years before and after the year shown except for 1955 data.

² Preliminary.

Source: The National Food Situation (N.F.S.) #73-Agricultural Marketing Service, U.S. Department of Agriculture Washington 25, D.C.

TABLE II. TRENDS IN PER CAPITA CONSUMPTION OF DAIRY PRODUCTS IN THE UNITED STATES

Year	Fluid Milk and Cream	Evap. and Cond. Milk	Dry Whole-milk (pounds)	Dry Non-fat Milk (pounds)	Ice Cream (Milk Equiv.)	Cheese	Butter	Margarine
1935-39	330	16.5	.1	1.9	24.6	5.5	16.8	2.8
1940-44	354	17.9	.2	2.9	36.0	5.5	14.4	3.1
1945-49	373	19.1	.4	2.9	47.1	6.8	10.5	4.9
1950-54	350	17.8	.3	4.3	46.0	7.5	9.2	7.3
1954	349	16.5	.2	5.1	47.0	7.8	9.0	8.4
1955	353	16.5	.2	5.3	49.0	7.7	9.2	8.3

Source: Agricultural Extension Service, University of Minnesota, U.S. Department of Agriculture

viewed many of the lesions and was impressed with what he calls the pleomorphic character of the lesions of arteriosclerosis. Many different things enter into it, such as necrosis, hyaline, fibrinoid and mucoid degeneration and pathologic calcification. He also admitted the high frequency or incidence of lipid deposits in these lesions. Warmann¹² reviewed other factors that may be involved in the atherosclerotic process. He emphasized that any ischemic injury to the arterial wall may be followed by an atherosclerotic plaque and that, secondly, there is evidence that the artery itself carries on metabolic processes and that this process may undergo a marked derangement in the diseased artery, resulting in abnormal deposits of phospholipid substances in the intima.¹³ Third, there is evidence that a primary thrombus in the arterial wall may result in atheromatous deposits. Lastly, vascularization and hemorrhage in the intima may be the primary factor, and atheromatous changes result from this injury. However, all of these pathologic processes seem to be associated with some disturbance in lipid metabolism.

Recent studies by Grieg¹⁴ suggest another theory of how the body deals with intravascular thrombi by fibrinolysis rather than by organization and incorporation of the thrombus into the vessel wall. Fibrinolysis was measured *in vitro* (estimated as tyrosine) in twenty-five healthy people, twelve men and thirteen women, ages nineteen to fifty-

six. Determinations were made after a fat-poor meal and a fat-containing meal. This revealed a conspicuous inhibition of fibrinolysis after the fat-containing meal, the degree of inhibition varied in proportion to the degree of lipemia, measured grossly by plasma turbidity. Exercise reversed to some extent the inhibitory process. The inhibition also was removed by giving the individual 10,000 I. U. of heparin twenty minutes before the specimen was taken. Finally, he determined that lipemia resulting from maze oil, unsaturated fats, did not inhibit fibrinolysis *in vitro*.

Ahrens et al¹⁵ noted a significant decrease in serum concentrations of free and esterified cholesterol and of phospholipids in six subjects when plant fats were substituted isocalorically for animal fats. This was carried out over a period of four months on a metabolic ward study.

The incidence of coronary artery disease in the American population seems to be definitely on the increase. Statistical studies of mortality rates among insured persons in the United States made by the Metropolitan Life Insurance Company¹⁶ revealed an incidence of 17 per cent mortality due to coronary artery disease in 1927, as compared to 42 percent in 1952. Coronary artery disease and cancer were the only two diseases that showed an increase in incidence. All others showed a decrease.

White,¹⁷ reporting on the incidence of heart disease in the New England area based upon data

TABLE III. CLINICAL ANALYSIS OF 1516 CASES WITH CHOLESTEROL DETERMINATIONS RELATED TO VASCULAR DISEASE

Control Group composed of:	
1. Negative clinical examination.....	402
2. Nonvascular disorders.....	572
	974
Vascular Group composed of:	
1. Hypertension without known coronary disease.....	220
2. Diabetes mellitus without known coronary disease.....	30
3. Hypometabolic group and those with myxedema.....	41
4. Peripheral vascular disease and CVA.....	39
5. Coronary sclerosis without infarction.....	124
6. Coronary thrombosis.....	87
Total	1515

Cholesterol determined by Bloor's method.

TABLE V. DISEASES OTHER THAN VASCULAR

	No. of Cases	Chol. under 250	Chol. 250-300	Chol. over 300
Under 50 yrs.				
F	191	80%	16%	4%
M	134	72%	19%	9%
Both	325	76%	17%	6%
Over 50 yrs.				
F	142	42%	39%	19%
M	105	62%	25%	13%
Both	247	50%	33%	17%
Totals	572	65%	24%	11%

obtaining from co-operating physicians, revealed that the incidence of coronary artery disease increased from 20 per cent in 1925 to 44 per cent in 1950. All other types of heart disease decreased, save congenital heart disease and cor pulmonale.

Investigations into the alteration of the American diet have given some interesting results. Table I gives the index per capita of consumption of the major food groups. This indicates a marked increase in the consumption of fats and oils, excluding butter. There has been only a moderate increase of meat, fish and poultry. However, this does not take into consideration the change in fat content in certain meats, particularly beef, due to the intensive feeding and inactivity through which these animals are subjected today compared with several decades ago. Potatoes, flour, and cereals have shown a rather sharp decrease in consumption.

Table II, showing trends in consumption of dairy products, reveals a rather marked decrease in butter from 1935 to 1955, but at the same time a marked increase in margarine, which is derived largely from soy beans. The consumption of ice cream has increased over 100 per cent during the same period. There has been a moderate increase in cheese. During this same period, hydrogenation of fats has taken place, and this

TABLE IV. NEGATIVE CLINICAL EXAMINATION

	No. of Cases	Chol. under 250	Chol. 250-300	Chol. over 300
Under 50 yrs.				
F	175	81%	16%	3%
M	139	80%	15%	5%
Both	314	80%	16%	4%
Over 50 yrs.				
F	63	35%	52%	13%
M	25	72%	12%	16%
Both	88	45%	41%	14%
Total	402	73%	21%	6%

TABLE VI. COMBINED NEGATIVE CLINICAL EXAMINATIONS AND ALL OTHERS NOT VASCULAR

	No. of Cases	Chol. under 250	Chol. 250-300	Chol. over 300
Under 50 yrs.				
F	366	80%	16%	4%
M	273	76%	17%	7%
Both	639	79%	16%	5%
Over 50 yrs.				
F	205	41%	41%	17%
M	130	64%	22%	14%
Both	335	49%	36%	16%
Totals	974	68%	23%	9%

has provided the housewife with a stable product, which needs no refrigeration, and is convenient to use.

The clinician is confronted with this apparent increase of coronary artery disease and the accumulating evidence tending to incriminate abnormal fat metabolism. What counsel should we give our patients? Most of us are aware of the fact that cholesterol levels may be reduced by markedly restricting fat in the diet, by the use of thyroid in the hypometabolic or myxedema patient, or by the use of estrogen in the hypercholesterolemia patient unresponsive to diet or not in the hypometabolic group. What is the desirable cholesterol level in man? It has been shown that cholesterol levels tend to increase from youth to middle age, and it would seem that cholesterol levels tend to be lower in the aged. Is it conceivable that the prolonged use of a high fat diet, such as we Americans utilize, could disturb homeostasis to any marked degree? Is the evidence sufficiently strong to disturb the dietary habits of individuals whose cholesterol levels are elevated? It is with this in mind, and probably to crystallize my own thinking, that a review of our clinical experience was undertaken.

This study was made upon a group of consecutive private patients, who were adequately studied either in our office or in St. Barnabas Hospital,

Minneapolis. There has been some attempt to classify blood cholesterol levels in relation to populations by their state of wealth or poverty. The group under study probably falls in the so-called

internal medicine. The fact that we live in a cold climate and in the middle of a dairy land may possibly influence the group under investigation.

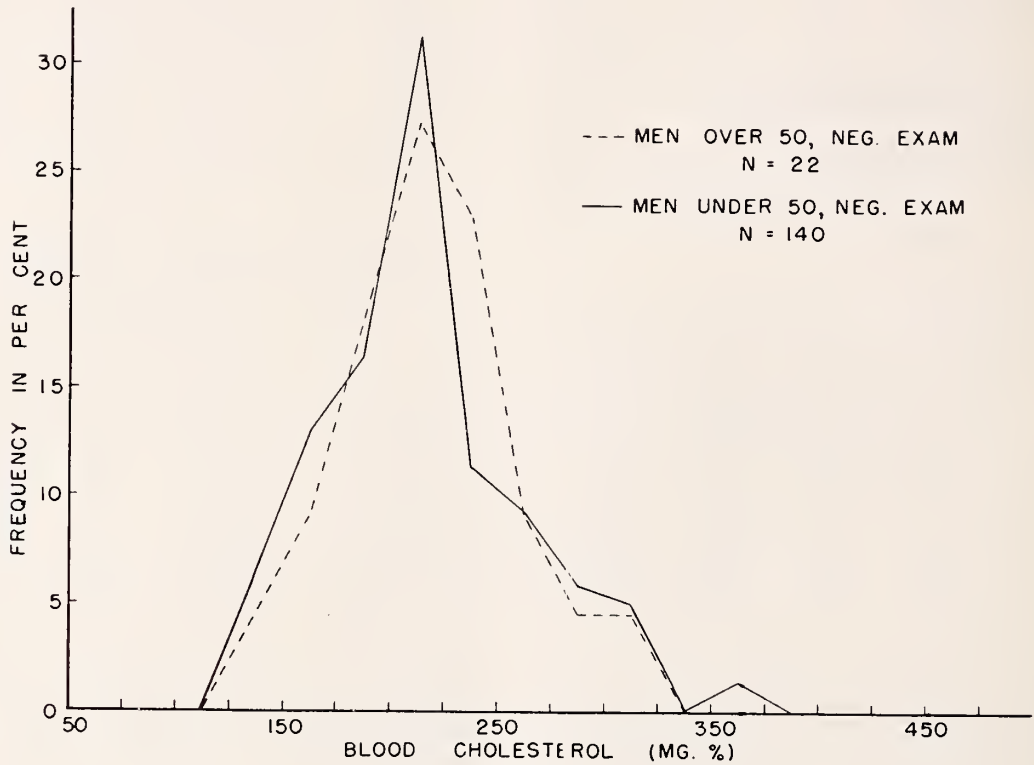


Fig. 1.

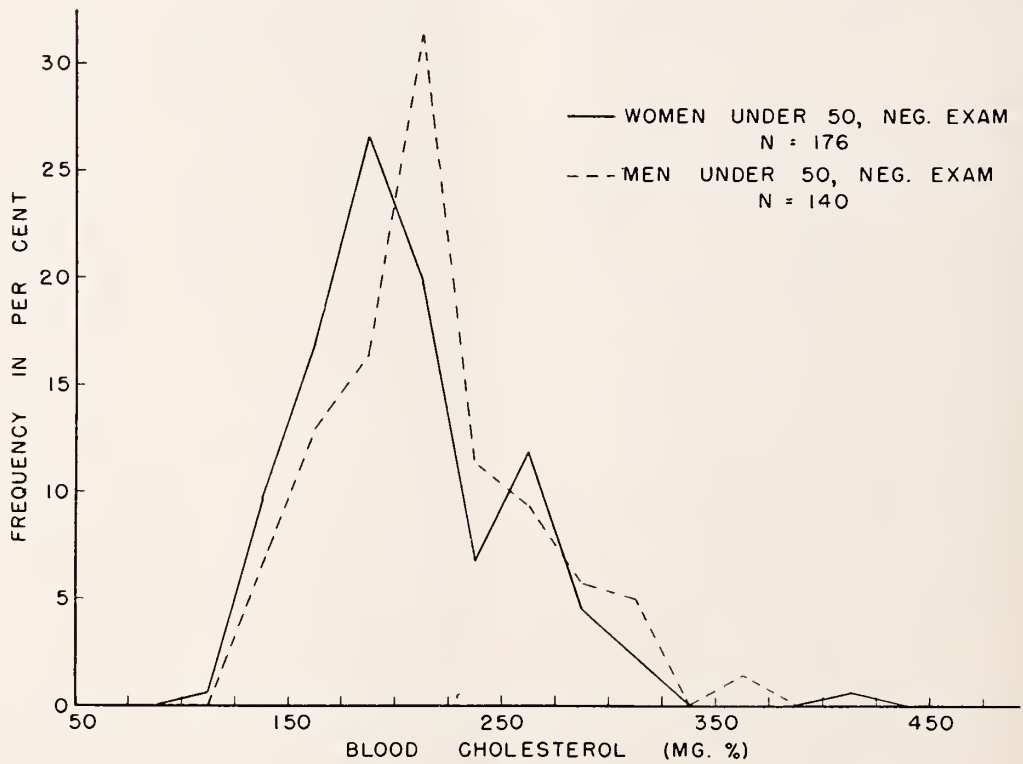


Fig. 2.

middle class, and I think it is representative of the practice of the average clinician if limited to

The cholesterol determinations were made in our own laboratory under the direction of the

same technician and also in the laboratory of St. Barnabas Hospital. The Bloor method was used for determination of cholesterol.

was further subdivided into 402 individuals whose clinical examinations were negative and 572 patients with diseases of a nonvascular character.

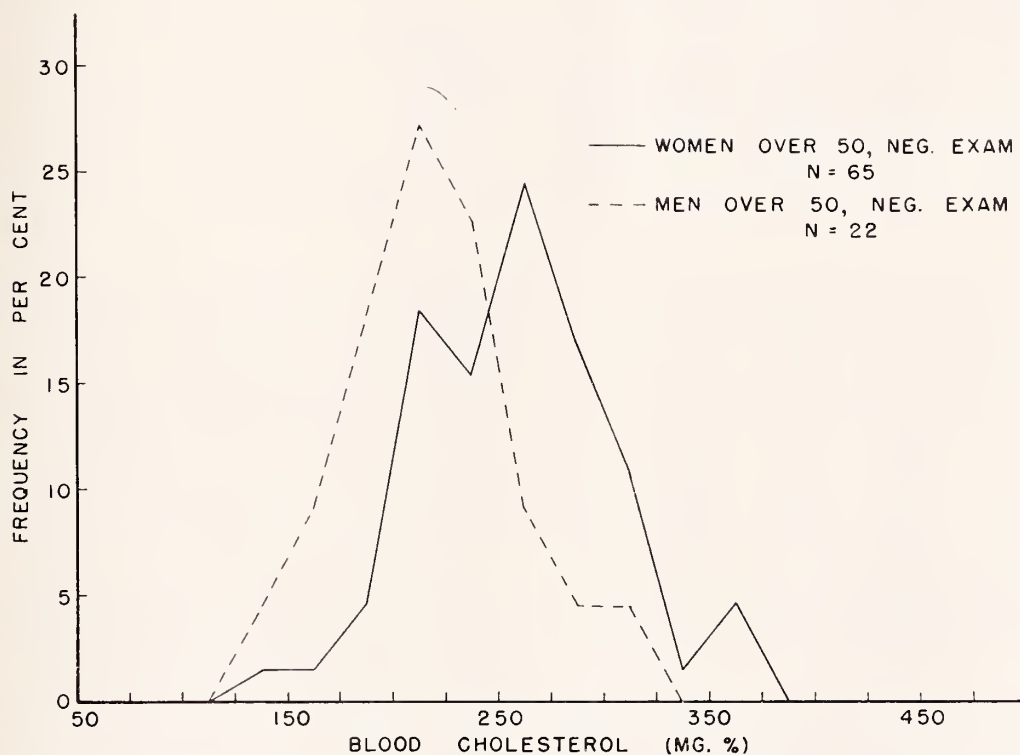


Fig. 3.

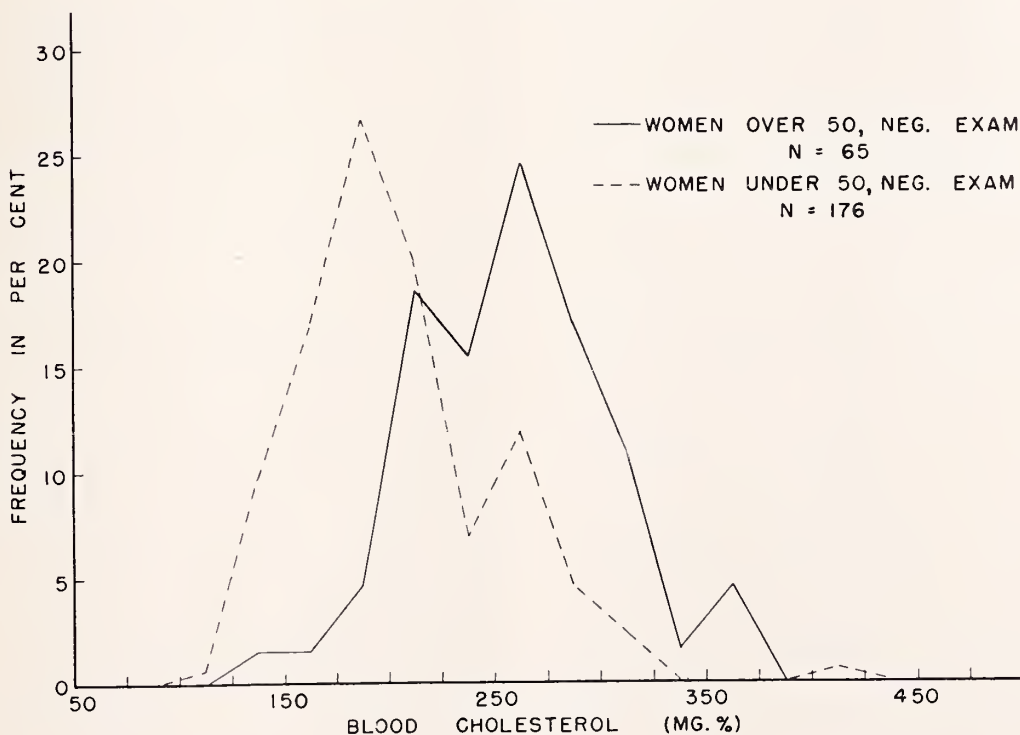


Fig. 4.

Table III presents the breakdown of the 1515 patients analyzed. Nine hundred and seventy-four patients were included in the control group, which

The group was then separated according to sex and age (over and under fifty years) and further grouped according to their blood cholesterol levels

TABLE VII. HYPERTENSION WITHOUT KNOWN CORONARY DISEASE

	No. of Cases	Chol. under 250	Chol. 250-300	Chol. over 300	Diabetes Mell.
Under 50 yrs.					
F	31	58%	32%	10%	3%
M	14	57%	14%	28%	7%
Both	45	58%	27%	15%	4%
Over 50 yrs.					
F	136	45%	33%	21%	5%
M	39	67%	26%	8%	8%
Both	175	50%	31%	18%	6%
Totals	220	52%	30%	18%	5%

TABLE IX. HYPOMETABOLIC PATIENTS

	No. of Cases	Chol. under 250	Chol. 250-300	Chol. over 300	Myxedema
Under 50 yrs.					
F	20	25%	35%	40%	5%
M	3	33%	0%	67%	33%
Both	23	26%	30%	43%	9%
Over 50 yrs.					
F	16	0%	31%	69%	25%
M	2	0%	50%	50%	50%
Both	18	0%	33%	67%	28%
Totals	41	15%	32%	54%	17%

Note: There were five hypometabolic patients with coronary artery disease not included.

(B.C.L.) (under 250 mgs. per cent, 250 to 300 mgs. per cent, and over 300 mgs. per cent). It was noted (Table IV) that approximately 80 per cent of the negative clinical examinations and 75 per cent of the nonvascular control group under age fifty had BCL's under 250 mgs. per cent, and 4 per cent and 6 per cent of these same groups had readings over 300 mgs. per cent. After age fifty, approximately 50 per cent of the women were shifted into a higher cholesterol classification, while the male shift was approximately 10 per cent. In a statistical study by Dr. Bearman (chi-square criterion), the two control groups were found to be essentially alike. However, in all statistical studies the negative clinical examination group was used as the standard for comparison.

Chi-square studies on the negative clinical examination group comparing men over and under fifty years of age revealed minimal difference in BCL concentrations, the over fifty-year age group showing only slight increase (Fig. 1). In comparing women to men under fifty years of age, there is a moderate increase in BCL in men (Fig. 2). There was, however, a striking increase in the BCL concentration in women over age fifty with negative examinations, as compared to men over fifty (Fig. 3) and to women under fifty (Fig. 4).

Table VII presents 220 patients with hypertension without known coronary disease. There

TABLE VIII. DIABETES MELLITUS WITHOUT HYPERTENSION OR VASCULAR DISEASE

	No. of Cases	Chol. under 250	Chol. 250-300	Chol. over 300
Under 50 yrs.				
F	6	33%	50%	17%
M	6	50%	50%	0%
Both	12	42%	50%	8%
Over 50 yrs.				
F	5	80%	20%	0%
M	13	70%	15%	15%
Both	18	72%	17%	11%
Totals	30	60%	30%	10%

was only a moderate shift of both male and female into higher cholesterol classification, the women again showing a substantial increase in BCLs after fifty years of age. Men over fifty with hypertension show only a moderate upward shift in BCLs, as compared to men with negative examinations (Fig. 5). There is even less shift in women in the same category (Fig. 6).

A small group of patients with diabetes mellitus without hypertension or known vascular disease was analyzed in the same manner. This group surprisingly compared very favorably with the control group, particularly in the over-fifty-year age category.

There were forty-one patients with a diagnosis of myxedema or hypometabolic state analyzed in the same manner. In the under-fifty-year age group, 73 per cent had cholesterols over 250 mgs. per cent; 100 per cent of the over-fifty-year age group had BCL's over 250 mgs. per cent and 69 per cent of the women and 50 per cent of the men had BCL's over 300 mgs. per cent (Table IX).

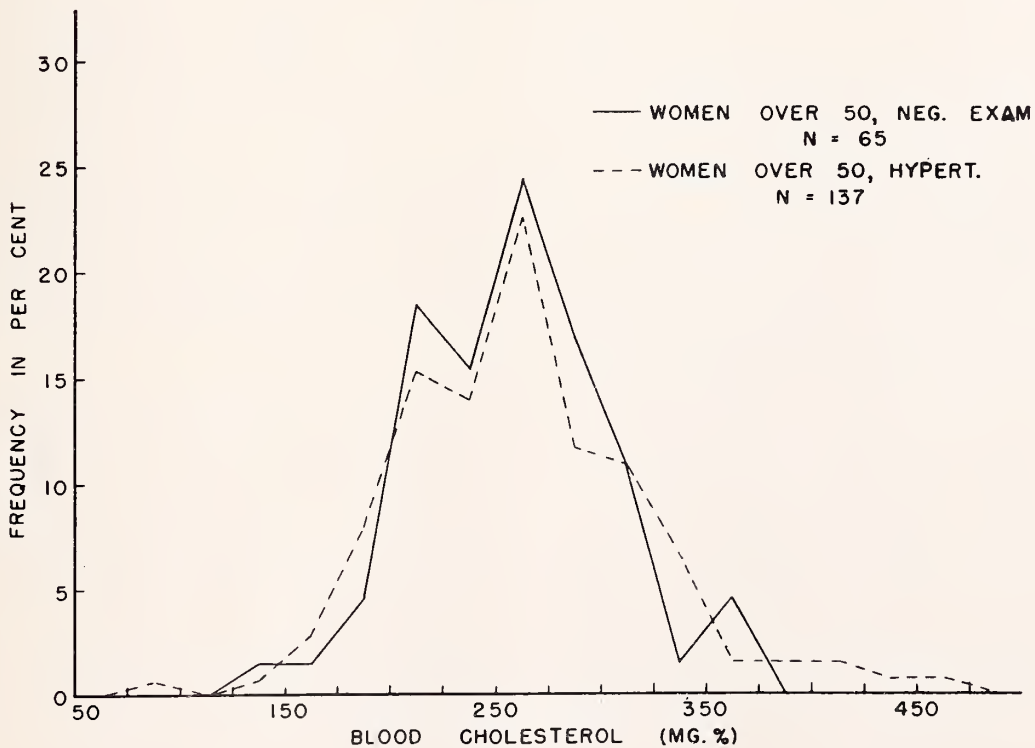
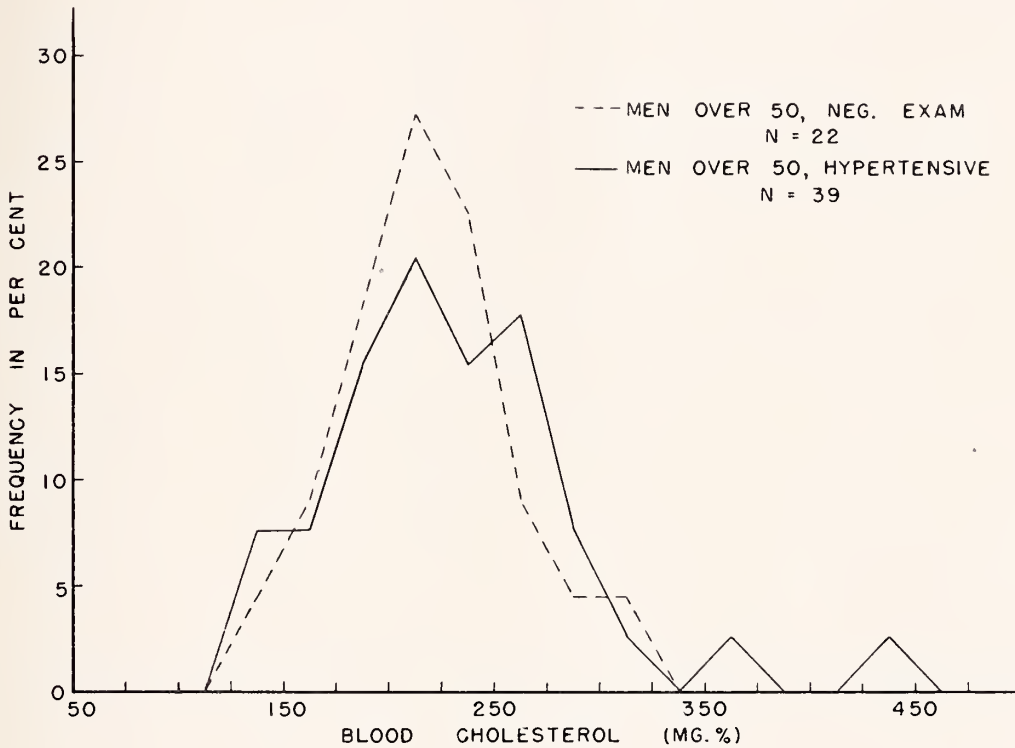
A group of thirty-nine individuals with a diagnosis of cerebral vascular accident and peripheral vascular disease were studied (Table X); five under fifty years of age had cholesterols not significantly elevated. Approximately 50 per cent had hypertension. In the over-fifty-year age group, approximately 70 per cent had BCL's over 250 mgs. per cent and more than one-third had hypertension. Eight per cent of this group had diabetes mellitus. There were seven additional cases not listed in this category that were listed under the coronary artery disease group.

A diagnosis of coronary sclerosis and insufficiency (not thromboses) was made in 124 patients, thirteen of whom were under fifty years of age and three of these were women (Table XI). Two of the women had BCLs under 250 mgs. per cent, one over 300 mgs. per cent, and hypertension was

present in two. Seventy per cent of the males had BCLs over 250 mgs. per cent. In the over-fifty-age group, there were 111 cases, fifty women and

36 per cent of the men had hypertension; diabetes mellitus was present in approximately 10 per cent.

In a group of eighty-seven patients, a diagnosis



sixty-one men. In 75 per cent of the women and 53 per cent of the men, BCLs were over 250 mgs. per cent; 54 per cent of the women and

of coronary thrombosis was made, sixteen were under fifty years of age, one of which was a woman with hypertension and a BCL under 250

TABLE X. CEREBRAL VASCULAR ACCIDENT AND PERIPHERAL VASCULAR DISEASE

	No. of Cases	Chol. under 250	Chol. 250-300	Chol. over 300	Hypertension	Diab. Mell.
Under 50 yrs.						
F	1	100%	0%	0%	0%	100%
M	4	75%	25%	0%	50%	0%
Both	5	80%	20%	0%	40%	1%
Over 50 yrs.						
F	17	24%	47%	29%	53%	6%
M	17	41%	24%	35%	24%	6%
Both	34	33%	34%	33%	38%	6%
Totals	39	38%	33%	28%	38%	8%

Note: There were seven additional cases of peripheral vascular disease that were included under coronary artery disease.

TABLE XI. CORONARY SCLEROSIS AND INSUFFICIENCY (NOT THROMBOSIS)

	No. of Cases	Chol. under 250	Chol. 250-300	Chol. over 300	Hypertension	Diab. Mell.
Under 50 yrs.						
F	3	67%	0%	33%	67%	0%
M	10	33%	50%	20%	33%	0%
Both	13	38%	38%	23%	38%	0%
Over 50 yrs.						
F	50	26%	32%	42%	54%	12%
M	61	47%	33%	20%	36%	10%
Both	111	38%	32%	30%	44%	10%
Totals	124	38%	33%	29%	43.5%	10%

TABLE XII. CORONARY THROMBOSIS GROUP

	No. of Cases	Chol. under 250	Chol. 250-300	Chol. over 300	Hypertension	Diab. Mell.
Under 50 yrs.						
F	1	100%	0%	0%	100%	0%
M	15	39%	27%	33%	20%	7%
Both	16	43%	25%	31%	25%	7%
Over 50 yrs.						
F	25	12%	32%	56%	44%	8%
M	46	30%	43%	26%	30%	4%
Both	71	24%	39%	36%	35%	6%
Totals	87	28%	37%	36%	32%	6%

mgs. per cent. Of the under-fifty-age group, 56 per cent had BCLs over 250 mgs. per cent, 31 per cent had BCLs over 300 mgs. per cent. There were seventy-one patients over fifty years of age in which 75 per cent had BCLs over 250 mgs. per cent, and 35 per cent had hypertension. Frequency polygons constructed by Dr. Bearman from his statistical analysis shows a fairly marked increase in BCLs in men over age fifty with coronary sclerosis as compared to men of the same age with negative clinical examinations (Fig. 7). Women over age fifty with coronary sclerosis have a moderate increase in BCL's as compared to men of the same age group with like diagnosis (Fig. 8). Men over fifty years of age with coronary thrombosis show a fairly marked increase in BCLs as compared to fifty-year-old men with negative examinations (Fig. 9). A marked increase in BCL in women over age fifty with coronary thrombosis as compared to women over fifty with negative examinations is shown in Figure 10. Further statistical analysis by Dr. Bearman,

comparing BCL's in men and women over fifty with coronary thrombosis, revealed a probability greater than .05 which would indicate a small difference and suggests that men and women in this category have approximately the same average BCL.

Methods of Reducing Blood Cholesterol Levels

Blood cholesterol levels dropped 50 to 100 mgs. per cent in sixty-four cases and over 100 mgs. in forty cases on dietary restriction only. This group, I believe, could be larger and the percentage drop in BCL's greater, if the patients were more meticulous with their diet. This was repeatedly demonstrated in patients who gradually became more interested or concerned with the importance of fat restriction. I learned early that substituting margarine for butter had no influence on BCL.

Cytellin was used in seven patients. This was effective to some degree, but there were a number that seemed to escape after it was used for a period. It is possible that the patients using this

gradually increased their fat intake, tending to diminish its effect.

Administration of thyroid extract was found to

usual care in detection, as they may possess none of the usual clinical characteristics of myxedema. A diagnosis of hypometabolism should be con-

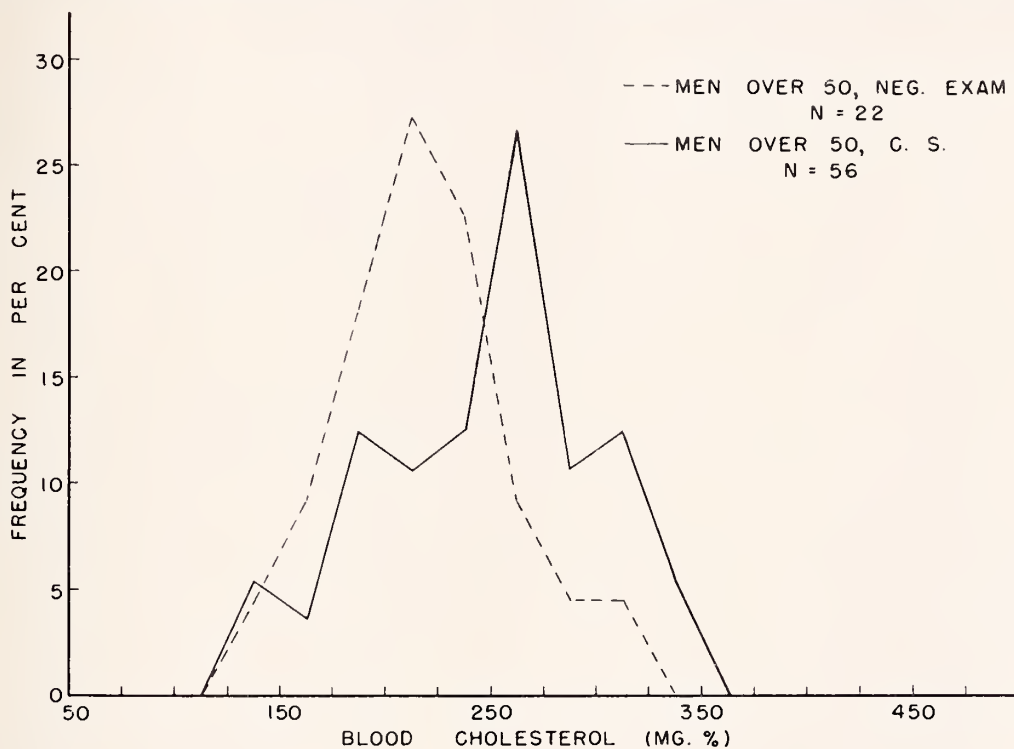
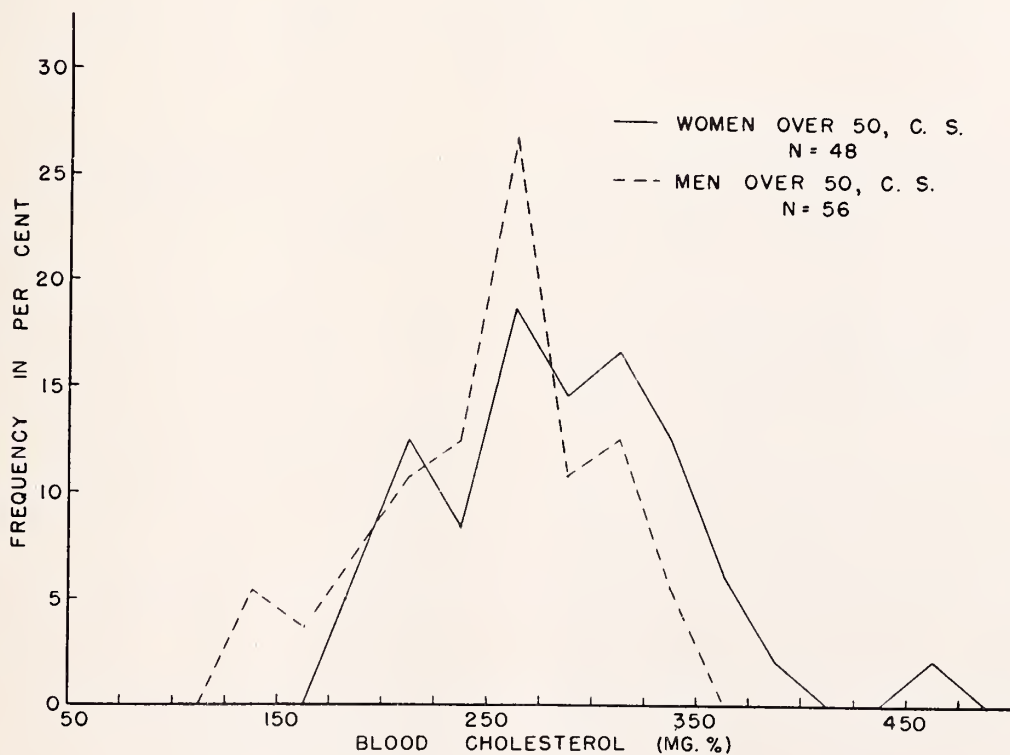


Fig. 7.



*Coronary sclerosis

Fig. 8.

have a marked influence on BCL's in the myxedema and hypometabolic patient. The hypometabolic group, without myxedema, requires un-

sidered in any patient with an elevated cholesterol and even a low normal basal metabolic rate, who is unresponsive to a low fat diet. They may

respond rapidly to small amounts of dessicated thyroid. As an example, a woman, aged sixty, with a history of previous coronary thrombosis and a BCL of 600 mgs. per cent, was totally un-

and they tend to discontinue the medication when it occurs. So far, no males have been willing to accept this medication when the side effects were explained to them.

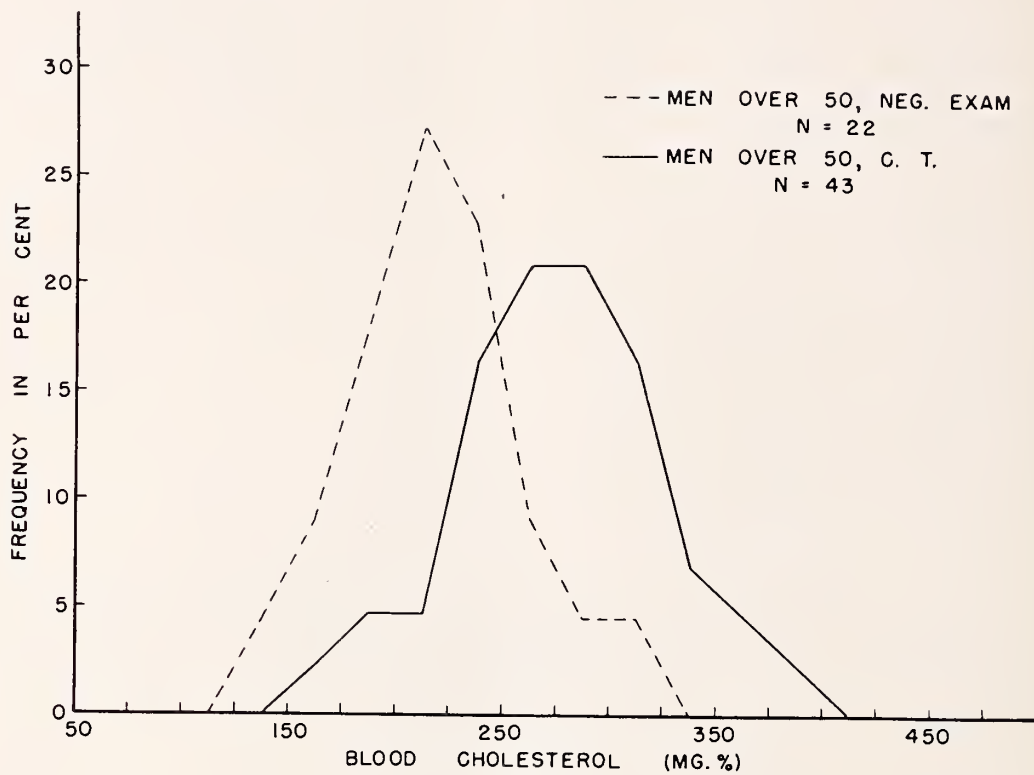


Fig. 9.

responsive to a very restricted fat intake over a period of several years. Her basal rate was minus 17 and 18 per cent. Peripheral vascular disease with claudication developed subsequently. The patient was given $\frac{1}{4}$ and $\frac{1}{2}$ grain of dessicated thyroid daily, with a resultant drop in BCL to 242 mgs. per cent in a few months. This was associated with a marked general improvement in her vascular picture.

Estrogen was used in a small group of women, who were unresponsive to dietary restriction, and, as has been reported by Barr,¹⁸ resulted in a marked drop in BCL. One patient, age fifty-two, with a BCL of 462 mgs. per cent and unresponsive to prolonged and rigid fat restriction, was given Estinyl, mg. 0.02 daily, with the BCL decreasing to 300 mgs. per cent. Estinyl was then increased to .02 and .04 on alternate days with a further reduction in BCL to 260 mgs. per cent. Uterine bleeding started, and the patient discontinued the medication. The BCL increased to the previous level within thirty days. I have found uterine bleeding generally disturbing to patients,

Summary

A group of 1,515 consecutive records of patients were analyzed in relation to blood cholesterol levels. The control group was composed of 974 patients, 402 of whom had negative examinations, 572 having nonvascular disorders. Chi-square analysis of the BCL of these groups proved them to be almost identical in behavior. Sixty-eight per cent of the combined control group had BCL's under 250 mgs. per cent. There was a striking upward shift of BCL in women more than fifty years of age.

BCL's of the control group were then compared to hypertensive patients without coronary disease, to diabetes mellitus, to hypometabolic patients, to individuals with cerebrovascular or peripheral vascular disease, and finally to a group of patients with coronary sclerosis and coronary thrombosis.

Patients having hypertension without known coronary disease had slightly higher cholesterol levels than the control group.

Diabetes mellitus did not seem to influence the BCL's as much as one would anticipate, 60 per

TABLE XIII. SUMMARY

	Cases Male and Female	Chol. under 250	Chol. 250-300	Chol. over 300	Hypertension
Control groups	974	68%	23%	9%	
Hypertension without coronary	220	52%	30%	18%	100%
Diabetes mellitus	30	60%	30%	10%	
Hypometabolic	41	15%	32%	54%	
Cerebrovascular accidents and peripheral vascular disease	39	38%	33%	28%	38%
Coronary sclerosis	124	38%	33%	29%	43.5%
Coronary thrombosis	87	28%	37%	36%	32%
Total cases	1515				

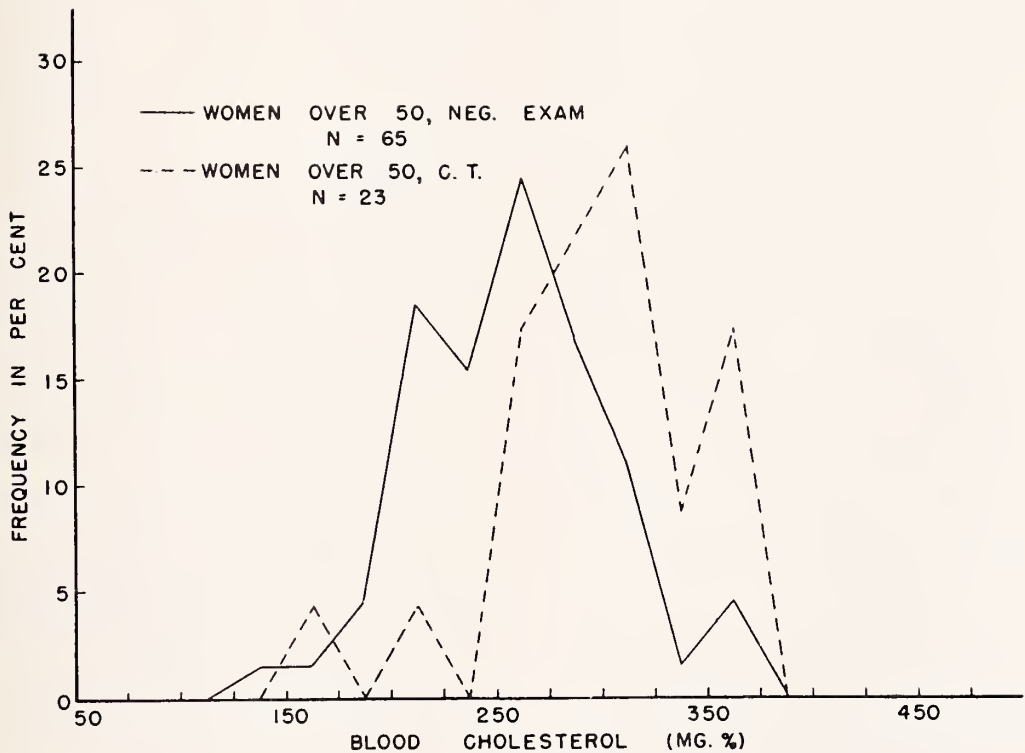


Fig. 10.

cent of the diabetic patients having BCL's under 250 mgs. per cent.

Patients with peripheral vascular disease and cerebrovascular disease showed moderate deviation from the controls, 69 per cent having levels over 250 mgs. per cent.

The hypometabolic group was markedly different from the control, 86 per cent having BCL's over 250 mgs. per cent.

The coronary sclerosis group was quite divergent from the controls, showing 62 per cent with cholesterols over 250 mgs. per cent.

A marked rise in BCL was noted in the coronary thrombosis group.

Cholesterol levels were influenced by diet, Cytellin, thyroid, and estrogen.

No definite normal level for BCL's has been stated. It is apparent that these levels are altered

upward from youth into the fifth and sixth decades and tend to drop with advancing years.

Evidence indicating an increase of coronary artery disease has been pointed out. Data showing an increase in the content of fat in the American diet were also presented.

Recognizing that much of this evidence is indirect and so far no scientific data have demonstrated a direct causal effect, it would seem that indirect evidence should warrant careful study of patients in regard to cholesterol metabolism. Probably we should question composition of our present diet in regard to its high fat content, possibly looking with suspicion upon some of the newer compositions that have been added. Investigations being carried out in numerous laboratories on the effect of unsaturated fats in atherosclerosis hold real promise and may answer some disturb-

ing questions, such as the lack of atherosclerosis in the Eskimo. Much more study is indicated, and the final answer must wait upon scientific advancement.

Addendum

Subsequent to the completion of this paper, a group of patients were placed on corn oil, the amount varying from 1 dram to ½ ounce three times a day, and cholesterol determinations were made at an interval of two to four weeks. Most of these patients had been on restricted fat diets prior to this. The cholesterol level dropped between 25 and 50 mgs. in twelve patients, 50 to 75 mgs. in ten patients, and 75 to 100 mgs. in five patients. The cholesterol level became moderately elevated in four patients. It would seem that a relatively small amount of this unsaturated oil had about the same influence as a larger amount. These patients have all been on corn oil for a short period of time, and one should not predict what influence it might have over a long period of time, nor should one attempt to draw any conclusions at this time upon its influence on atherosclerosis. Only a prolonged period of subsequent observation will determine this.

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DIODOQUIN IN THE TREATMENT OF CHRONIC DIARRHEA

Attention is drawn to the beneficial effects which may follow therapeutic trial of Diodoquin in chronic diarrhea. Nine cases of chronic diarrhea are reported. Seven had been studied carefully elsewhere. All had been diagnosed and treated as functional diarrhea. All patients complained of persistent diarrhea in spite of treatment. Several had developed very serious complications. All patients made a satisfactory response to this drug. The therapeutic trial can be accomplished as follows:

The patient is instructed not to change his medication or diet. Thirty 10-grain tablets are ordered. The patient is instructed to take one tablet at 9:00 a.m., one at 3:00 p.m. and one at 9:00 p.m. The doctor must avoid entering into a detailed discussion with the patient. If some explanation is unavoidable, the patient can be told that his diagnostic examination is continuing. He is asked to return in ten days.

If the disease is functional, the patient is likely to report no marked change. If the patient reports that he feels considerably stronger, that intestinal cramps and aching have decreased, that the stools are fewer and definitely better formed, and that gas, bloating and urgency have decreased—then real progress has been made.

Physical examination usually reveals less tenderness over the cecum and in the descending and pelvic colon. If this prevails, a second course is started, to last ten more days.

The physician must remember to explain that continued improvement may be interrupted by mild flare-ups. The usual course lasts thirty days. It is believed that no patient with recurrent diarrhea should be denied a therapeutic trial because all laboratory examinations have been reported negative.—A. L. JENKS, JR., *J. Iowa M. Soc.*, 47:529 (Aug.) 1957.

Evaluation and Management of Minor Contusions of the Eye

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OCULAR trauma is a large subject; therefore this discussion will be limited to minor contusions of the eye.

The "old-fashioned black eye" must not be belittled—at least by the eye physician consulted. A "black eye" is often the object of derision, the source of much humor and kidding; but it may be mute evidence behind which serious injury to the eye is hidden and which, if neglected, may turn comedy into tragedy.

All phases of human activity give rise to minor and major injuries. It behooves us to give thought to what to expect in the event of a national emergency when injuries will far outnumber our refractions and cataracts; then, certainly, contusions will be one of the major causes of ocular disability. Such injuries may appear insignificant on first inspection, but major complications may develop within a few days or a few weeks.

Concussions and contusions of the eye are caused by blunt objects, jarring or blasts; they are nonpenetrating.

The term "concussion" is best applied to changes which are in a large part reversible; but when the force of the impact has been sufficient to disrupt the walls of small vessels, the term "contusion" is more appropriately employed. It must be remembered that an external impact of sufficient force will cause internal lacerations, at the same time leaving the surface layers intact.

Since minor eye accidents occur very frequently, it is important to consider the normal anatomic and physiologic factors which protect the eye. The bony orbital margins are an important line of defense. The eye is well protected by the forehead, bridge of the nose, and the malar and zygomatic prominences. The globe is suspended within the socket and is cushioned by fat. The eye is movable

and gives way when pushed. The winking reflex, and the ability of the head to move rapidly and reflexly if an object is seen coming toward it are important safety mechanisms. All of these are factors in the protection of the eye, which otherwise would be injured to a much greater extent.

Because of the modern tendency of the injured to invoke legal procedure or at least to submit a batch of insurance papers to be filled out, it is extremely important that every traumatic case the physician sees be considered from a medicolegal point of view. This not only offers protection to the patient primarily, but also to the doctor who handles the case and to any third party, such as an employer or an outright attacker. Much of the viciousness of the present malpractice situation may be ascribed to carelessness in recording the facts, findings and observations in patients' records. It is easy to say "Oh, he just has a good old-fashioned black eye" and to be careless in the examination. A jury in court for malpractice may feel differently. Examination and history should be as thorough as time and opportunity permit.

History

First, and most important of all, is a short, concise but detailed, history. This must include the patient's full name, age, address and phone number; if injured at work, the name, address and phone number of the employer; and the name or names of persons who might have been attackers or in some way responsible for the injury.

One must know as much as possible about the cause of the injury—the kind, size and shape of the object that produced it. Such information often suggests the type of damage to look for and often makes a great difference in the treatment and prognosis. A blow on the eye with a fist and a blow from an explosion may look the same so far as the eye is concerned, but in one we will look for a retained foreign body and in the other we will not.

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The status of the patient's eye prior to the accident should be included in the history. This is a point of prime importance from the medicolegal angle. We are prone to assume that the patient's eyes were normal before injury; whereas we may be dealing with an amblyopic, previously injured, pathologic or actively diseased eye.

It is important to find out if the patient was wearing glasses or goggles at the time of injury and if possible to examine them for breakage or a bent frame. If the patient has glasses, it is of value to have in your record the lensometer readings of his correction. Myopic persons, for example, can be expected to suffer more often from retinal detachment than a hyperope. The same, perhaps, is true of the patient with an old healed chorioretinitis. These individuals should be examined more carefully and should be followed up with these factors in mind.

Examination

The most important aid in the examination of an injured eye is not a flashlight, not an ophthalmoscope, not a slit-lamp and corneal microscope, but a visual acuity chart. A visual acuity determination of some sort must be made—not of just the injured eye, but of both eyes—and if glasses are worn, the vision both with and without glasses. True, it may be inconvenient and time-consuming, but it is important. If the patient can only count fingers or see hand movements, we have reason to be concerned about the extent of his injury. On the other hand, if he can read 20/20, despite a tremendous ecchymosis, we are quite relieved.

Gross inspection is next. Most cases of ocular trauma affect one eye only and naturally, we examine this eye carefully. It is of valued importance to examine the uninjured eye and to use it as the "control eye" for comparison purposes as one's systematic inspection is carried out. Further inspection is then made with a loupe, oblique, retro- and slit-lamp illumination, as indicated in each case. Transillumination over wide areas of the sclera often reveal injury not disclosed by other methods of examination. Ophthalmoscopic examination is necessary for inspection of the posterior segment of the eye.

With minor contusions of the eye a variety of effects can occur making themselves evident in characteristic fashion in the various ocular structures. I shall mention and discuss briefly some of the resulting lesions.

Lesions of the Lids

Edema and hemorrhage.—Here the treatment is expectant; the suffusion is self-limiting and is best left alone to absorb. In the beginning, cold compresses are usually recommended, to be followed in twenty-four hours by warm applications and massage.

Emphysema.—This complication will occur with fractures of the nasal and ethmoid bones of the medial side of the orbit. Injudicious blowing of the nose will not only make the condition worse, but there is the danger of spreading infection from the nose into the orbit and eyelids. A "black eye" associated with bleeding from the ear must be treated as potentially very serious because the patient may have a skull fracture.

Lesions of the Conjunctiva

Hemorrhages.—In the conjunctiva, minor contusions may produce hemorrhages which may vary from small petechiae to extravasations of considerable size. Of themselves, they are of little importance. When the most dense portion is quite forward toward the limbus, it is likely only local bleeding. If the denser and more extensive part of the hemorrhage lies posteriorly, where no edge is apparent, and anteriorly does not reach the limbus, one can suspect it is blood that has tracked forward from the orbit following a fracture of the orbital walls or the base of the skull. Blood from a remote point is purplish, not bright red; also subconjunctival in site (rather than intraconjunctival) over which the conjunctiva can be moved.

Edema and chemosis.—Conjunctival edema and chemosis may occur. In minor contusions, this is of no consequence, but one must inspect carefully in these instances for ruptures of the sclera, et cetera.

Lesions of the Cornea

Edematous changes.—Often after slight contusions, edematous changes may be evident in the corneal epithelium, endothelium or substantia propria. The superficial edematous opacity may actually become an abrasion—the treatment of which is simple. In interstitial edema the opacity is associated with some pericorneal injection and subjective irritation, but it clears without specific treatment, frequently in a few days, although its final disappearance may be delayed for some weeks.

Blood-staining of the cornea.—Fortunately, this is a somewhat uncommon result of a contusion. It occurs with a massive hyphema and raised intraocular pressure. Treatment is unavailing once the opacity has developed.

Folding of corneal tissues.—Folds of Bowman's, but more commonly of Descemet's, membrane are an occasional result of contusions, producing deep striate opacities. Treatment is expectant.

Lacerations of the cornea.—If the cornea has been indented quite forcibly, interstitial tears of its tissue will occur. Bowman's membrane and the epithelium survive better in these instances because of their elasticity, but Descemet's membrane with its slight elasticity will give way. These ruptures are usually obscured by coincident edema of the corneal tissues, but as the endothelium repairs the defect by laying down a new membrane, this generalized opacity tends to clear. At other times, the formation of fibrous tissue leaves a permanent interstitial opacity. Frequently a high degree of myopia or irregular astigmatism results.

Lesions of the Iris and Ciliary Body

Traumatic Miosis and Spasm of Accommodation.—This condition is usually transient, followed frequently by iridoplegia. Often it lasts for a considerable period. No treatment is necessary, but if inconvenience is caused, the instillation of atropine may give relief.

Traumatic Iridoplegia and Cycloplegia.—A dilatation of the pupil is a very common sequel of a contusion of the globe. The functions of the iris and ciliary muscle are usually affected simultaneously. The pupil is moderately dilated with very diminished reaction to light and accommodation, both direct and consensual. The condition may resolve in a few weeks, but as a rule the deformity is permanent.

The symptoms following a lesion of this type concern mainly the impairment of the function of the ciliary muscle. This requires the use of a cycloplegia correction, and later the constant wearing of the full refractive correction for both distant and near vision. Miotics can be used to constrict the pupil and diminish any discomfort due to dazzling.

Vascular Changes.—Contusions initially produce an ischemic spasm of the uveal vessels, followed by prolonged reactive hyperemia. Clinically, one sees

circumcorneal injection and an edematous appearance of the iris. Slit-lamp examination will reveal a flare due to the presence of increased protein in the anterior chamber. Such manifestations disappear very rapidly.

Small hemorrhages in the iris are merely a further extension of the hyperemia and exudative reaction just described. They are of no special importance and are absorbed in a few days.

Traumatic hyphema is an accumulation of free blood in the anterior chamber, is a logical sequence of the same process, and is a common observation in mild contusions of the eye. Such hemorrhages usually absorb rapidly, but the picture may be complicated by the occurrence of secondary hemorrhages.

Complications may arise with hyphema, particularly when it is massive and when secondary hemorrhages occur. The most important is the occurrence of secondary glaucoma, and associated with the rise in tension is the development of blood-staining of the cornea.

Traumatic hyphema, particularly the recurrent type, has been generally overlooked in ophthalmologic textbooks, and the literature concerning it is meager. In the presence of hyphema, expectant treatment without the instillation of atropine is probably the safest course, as long as the tension is normal or low. The use of any mydriatic seems unnecessary and may be dangerous. From the theoretical point of view, the greater the surface of the iris available, the more rapid will be the absorption of the hyphema. In those cases where treatment is indicated a miotic is suggested, since mydriasis may actually embarrass the drainage channels. If the entire chamber is filled with blood, and at the earliest moment if a raised tension appears, a paracentesis should be done.

Lacerations of the Iris and Ciliary Body.—Small tears and lacerations of the iris and ciliary body after comparatively slight injuries are more common than is realized. Tears of the sphincter muscle are often difficult to see clinically, and are made most obvious by transillumination, in which case the torn area appears as a reddish glow. Changes in the pupillary contour and local embarrassment of dilatation are findings associated with such tears.

Tears at the pupillary border are common and generally involve the whole depth of the tissue, anterior stroma, sphincter and pigment epithe-

lium. Only when the sphincter itself is torn is there a permanent functional disability. In these lesions no treatment is of value.

Iridodialysis.—When the trauma is of considerable severity, the iris may be to a greater or lesser extent torn away from its insertion into the ciliary body. In most instances the tear is small, and depending on the size of the tear, the pupillary margin is deformed, becoming flattened opposite the lesion. In most instances, after the usual period of rest and expectancy, no treatment is required.

Inflammatory Changes.—Vasodilatation and varying degrees of inflammatory reaction in the anterior uveal tract occur after contusions. The reaction may be transient and of little consequence, but one must bear in mind that even extensive changes (edema and inflammatory infiltration, subsequent development of fibrous tissue which replaces muscle fibers, and eventually atrophy) can occur after comparatively trivial contusions.

Pigmentary Changes.—Following minor ocular contusions one almost always sees a powdering of uveal pigment on the surface of the iris, back of the cornea, the anterior lens capsule and frequently in the vitreous. The corneal pigmentation is usually transient, but the deposits on the lens and in the vitreous tend to be permanent.

Direct blows on the eye may leave an imprint of the pigmented pupillary border on the anterior lens capsule. Vossius ring is interesting by itself, but is not dangerous and usually clears up within a few weeks.

Lesions of the Lens and Zonule

Lens Opacities.—Next to hemorrhage in the eye, the most noticeable result of contusion, although not always immediately visible, is lenticular involvement. Injury to the lens and its supporting mechanism occurs with unexpected frequency even after minor contusions of the globe—in 60 per cent of cases according to Davidson.*

Contusion cataracts may be associated with or without a capsular tear. The opacification in the

first type is due to the free entry of aqueous into the lens; in the second, to a derangement of the normal semipermeability of the capsule leading to a similar but less dramatic imbibition of fluid. Even in the observable presence of a tear in the anterior lens capsule, the opacification may remain localized or even disappear so that normal vision results.

A great variety of lenticular changes follow contusions. As a rule the opacity is localized and stationary, with quite characteristic morphologic appearances.

Apart from the rapid development of a diffuse cataract in the presence of a large capsular tear, the prognosis of contusion opacities in a lens under the age of thirty is good, while after this age it should be guarded.

Subluxation and Dislocation of the Lens.—Injury to the suspensory mechanism of the lens is a common sequel of contusion. It is quite understandable that if the zonule is already degenerate or atrophic, as occurs in the elderly, in high myopia or in old uveitis, an injury so slight as rubbing the eyes may cause dislocation of the lens.

Partial dislocation or subluxation is frequent. The clinical appearance, signs and symptoms of the dislocated or subluxated lens are well known. Occasionally, the eye remains quiet indefinitely. Usually less fortunate events ensue and traumatic opacities appear, but more frequently, perhaps, is the complication of a violent irritative iridocyclitis and a secondary glaucoma.

In complete traumatic luxation the lens will be found in the vitreous twice as often as in the anterior chamber. It is better tolerated in the vitreous. If it is dislocated into the anterior chamber, an intractable iridocyclitis and fulminating glaucoma supervenes.

The treatment of subluxation and dislocation of the lens presents problems of unusual difficulty in pre-operative judgment and operative technique. In recent years I have handled cases of subluxated lenses much more successfully than I did some years ago. Anesthesia is most important. Essential requisites are full akinesia of the facial nerve, a retrobulbar injection with Wydase®, a prepared conjunctival flap and three preplaced sutures. Capsule forceps are dangerous, whereas extraction of the lens without vitreous loss is often possible with the erisophake. A wide iridectomy and scoop extraction are often necessary.

*Davidson, M.: The minor sequelae of eye contusions, *Am. J. Ophth.*, 19:757-769 (Sept.) 1936. Lens lesions in contusions: A medico-legal study, *Am. J. Ophth.*, 23:252-271 (Mar.) 1940.

Lesions of the Choroid

The choroid suffers the same type of contusion effects as the iris. The wave of pressure causing the vitreous to force the choroid against the resistant sclera and the rebound gives rise to a traumatic ischemia, followed by a reactive hyperemia with edema and hemorrhage. To this must be added the possibility of lacerations involving tearing of the blood vessels and stroma.

The symptoms of a choroidal rupture vary with the site. The function of the overlying retina is always destroyed.

The treatment of choroidal rupture is rest and expectancy.

Traumatic choroiditis varying in size and distribution frequently follows the traumatic vascular reaction characteristic of contusions. The symptoms of traumatic choroiditis correspond with those of a mechanical rupture, and treatment again is expectant.

Lesions of the Retina

Damage to the retina after even minor contusions to the globe, affecting particularly the macula and periphery, is common. The contusion causes necrosis of nerve cells, edema and hemorrhage with minute lacerations of the tissues themselves. In the retina these changes are especially important. The ophthalmoscopic picture of abnormality may be transient, but the after effects can be permanent and disastrous. Slight pigmentary changes at the macula, often seen with difficulty and readily overlooked, may permanently impair central vision to a degree far greater than the clinical picture would suggest.

Again, degeneration in the periphery of the retina or a small tear in this region may lead to a retinal detachment a considerable time after the contusion.

Contusion injuries to the retina carry unusual medicolegal importance and careful and repeated examinations of the fundus should be made after any accident.

Lesions at the Optic Disk

Papillitis causing considerable swelling of the disk may be associated with ocular contusions of moderate severity, and, of course, optic atrophy may be a sequel of widespread retinal or choroidal damage.

Effects on the Vitreous

Even in minor contusions we can expect to find changes in the vitreous. As a result of the reactive vasodilatation, a plasmoid diffusion rich in protein appears in the aqueous, which penetrates the vitreous, disrupting its framework and leaving elements deposited on its fibril framework.

Vitreous hemorrhage is a common observation in minor contusions originating probably from the ciliary region. Absorption of these hemorrhages is usually slow, and little can be done therapeutically to hasten resolution.

Minor contusions rarely cause damage to the sclera. Ruptures of the sclera occur in instances of both direct and indirect contusion.

Changes in Refraction

Post-traumatic changes in refraction are well known, occasionally involving a hypermetropia, but more commonly myopia.

Traumatic hypermetropia is usually associated with paralysis of accommodation and may be either temporary or permanent. Bifocal glasses may have to be used in order to tide the patient over in his near work. Organized material beneath the retina after rupture of the choroid explains the phenomenon in some cases. Posterior dislocation of the lens with increased depth of the anterior chamber will, of course, change the refraction in the direction of hypermetropia.

Traumatic myopia is the more common refractive change following contusions of the globe. Ciliary spasm probably accounts for most of the cases and explains why they improve in a few days. If the refractive change persists, the plausible explanation is damage to the suspensory apparatus, permitting an increase of the lenticular curvature.

Changes in the Ocular Tension

Contusions often affect ocular tension and when this is so the tension tends to be unstable, sometimes being raised, sometimes lowered. This instability is often shared to some extent by the uninjured eye. Usually the instability passes without serious effects, but a severe and intractable glaucoma can be an end result as well as a persistent hypotony. The underlying cause in all such cases is probably vascular in origin.

(Continued on Page 816)

Treatment of Tuberculosis in the Aged

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THE PAST generation has witnessed many changes in the makeup of the population in this country. The more adequate food supplies and better facilities for their distribution have decreased deaths from famine. Better living conditions and improved health measures have reduced mortality rates and eliminated epidemics which formerly depleted populations. Medical science, antibiotics and chemotherapy have saved thousands of lives that otherwise would have been lost. These and many other factors have resulted not only in an increasing population, but also in a greater percentage of older individuals. These shifts have brought new responsibilities to the medical profession, and particularly to the sanatoria treating tuberculous patients.

About thirty years ago, the usual patient entering the sanatorium with active tuberculosis was a young girl between fifteen and twenty-five years of age. At this time the females outnumbered the males by a wide margin. Today the average patient entering the sanatorium is an elderly male, often discovered to have tuberculosis by a routine chest x-ray taken in the city jail where he was detained for drunkenness. The routine general hospital admission x-rays are responsible for the discovery of many cases and the x-ray screening of inmates in homes for the aged and rest homes account for others. Some are discovered as a result of studies of contacts of known tuberculous patients.

That the shift in the age distribution is not a local phenomenon is well demonstrated in the accompanying tables.

There was a time when tuberculosis in the older age groups was considered to be a slow chronic process which smoldered along without too much reaction on the part of the patient and without too much damage to those around him. Such individuals were thought to possess good resistance and to handle their disease quite well. When bed rest constituted our chief weapon against tuberculosis, the results from treating older persons were not particularly good, because it was found in-

advisable to keep these patients immobilized for long periods of time because of the intercurrent complications which developed. Nor were collapse therapy measures of great help.

Increasing experience and knowledge has shown that many of our previously-held ideas and notions concerning the age and development of tuberculosis in these people were not true. The previous concept that the tuberculosis in many of these persons had been present for years and merely smoldered along has frequently been disproven by the records of previous tuberculin tests or a review of previous x-ray films. This may have been true many years ago when most of our population received their contamination and infections early in life, but does not hold today when the vast majority reach adult life or even middle age without having acquired a tuberculous infection. It is not at all uncommon to have people of advanced years, even up into their eighties, present an apparently primary pleural effusion or a massive apparently primary parenchymal infiltrate similar to those we used to see in young people, and at the same time have medical records of previous tuberculin tests or chest x-ray films of fairly recent date to prove that these lesions did not exist a short time before. Likewise, the response of many such lesions to specific treatment has been too rapid for old chronic fibrotic disease.

The diagnosis of tuberculosis in the aged is frequently delayed or missed because of past disease or previous diagnosis of associated conditions which may simulate, mask or obscure the tuberculous process. Probably the most frequent mistake that is made lies in accepting a previously established diagnosis of bronchitis, bronchiectasis, asthma or emphysema without making adequate studies to be sure there is not also an associated condition. Unless the physician carries with him a high index of suspicion for tuberculosis and carcinoma when confronted with any pulmonary condition in an older patient, he will not infrequently fail to arrive at the correct diagnosis.

Tuberculosis is where we find it, in all ages, all

ances, and all circumstances of life. Especially confusing from the clinical standpoint are the patients who present, not one, but two or three different conditions at the same time, such as bronchogenic carcinoma and tuberculosis, bronchiectasis and tuberculosis, bronchial asthma, pulmonary emphysema and tuberculosis. The tubercle bacilli disseminated by such a patient are just as infectious as those of any other open active case of the disease and are more dangerous to the attending nurses and to the family or associates, because no precautionary measures are invoked.

There are certain groups who should always bear careful scrutiny because of the increased incidence of tuberculosis among them. These include patients with diabetes, alcoholism, silicosis, the mentally disturbed, those receiving cortisone, and some who have had an extensive gastric resection. In some of these, it is probably not the original condition *per se* which is responsible, but rather the semi-starvation or associated undernutrition. It has been estimated that approximately ten per cent of all diabetic patients develop tuberculosis. It is likely to develop insidiously and not infrequently in a rather bizarre and unusual manner, often with basal or midlung involvement rather than the more usual apical or posterior segmental distribution. Certainly all diabetic patients should be carefully watched, and particularly those presenting a positive Mantoux test. A chest x-ray study at least every six months would appear to be warranted.

Chronic alcoholic individuals are not too careful about their habits and associates, and over long periods of time allow their drinking to interfere with their nutrition and rest; hence they are more than usually susceptible to the development of tuberculous disease. Each year our sanatoria admit a number of persons whose tuberculosis was first discovered following routine x-ray studies of the chest of inmates of the jail or workhouse, detained there usually because of drunkenness. These same alcoholics subsequently become a serious disciplinary problem in the sanatorium because of their drinking propensities.

The high incidence of tuberculosis among patients suffering from silicosis has long been known to the medical profession. These people require repeated and careful screening to detect tuberculosis before it has progressed too far, especially among those who are tuberculin-positive. It is essential that these persons be discovered

TABLE I. AGE DISTRIBUTION IN TUBERCULOSIS

	1925		1955	
	Under 50	Over 50	Under 50	Over 50
Glen Lake Sanatorium 518 admissions	M 206 F 265	33 405 14	M 113 F 118	123 51
	471	47 9.05%	231	174 42.9%
North Dakota Sanatorium 168 admissions	M 71 F 97	7 271 2	M 72 F 99	64 36
	168	9 5.08%	171	100 36.5%

TABLE II. PATIENTS OVER FIFTY YEARS OF AGE WITH TUBERCULOSIS

		50-60	60-70	70+	Total Admissions
Glen Lake Sanatorium	1925	27	16	4	518
	1955	82	59	33	405
North Dakota Sanatorium	1925	8	1	0	177
	1955	41	21	38	271

promptly so that they may be removed from their usual work and contact with their fellow workers, many of whom may also have silicosis. From the standpoint of treatment, they must be treated early and intensively to avoid an unfavorable prognosis.

The insane and others who are mentally disturbed often have poor hygienic habits, have feeding problems which interfere with their nutrition, and are frequently in contact with others who are ill. These same factors apply to the senile as well as to the truly insane. Repeated and careful observation should be made of all such patients.

Many older persons suffer from arthritis and not a few from the rheumatoid type. The present tendency of physicians to use the steroids in the treatment of these and other conditions has brought to the sanatoria some patients who have developed tuberculosis or whose old tuberculosis has flared up following steroid therapy. A note of caution, then, should be sounded in using such therapy in any patient who has any evidence of previous tuberculosis, even if apparently obsolete and perhaps also in any patient presenting a positive Mantoux test. If the steroid therapy must be administered for the relief of symptoms which cannot be alleviated in any other way, then the advisability of giving concomitant anti-tuberculosis therapy should be given serious consideration.

Patients who have had an extensive gastric resection, either for ulcer or for malignant dis-

ease, may present serious nutritional problems because of anorexia or other reasons. When the general nutrition is impaired, these persons may become good candidates for acquiring or developing tuberculous disease. Most sanatoria have occasional patients in this category. Their successful treatment is not an easy problem.

Treatment

Adequate treatment of tuberculosis in the elderly individual is essentially the same as the treatment of tuberculosis in others, modified to meet the needs and limitations of the elderly patients. This consists essentially of isolation, a modified rest program, specific anti-tuberculosis therapy, complete general study of the individual, and later, perhaps, surgical therapy by collapse or resection of specific areas of the lung.

Isolation.—While it may seem cruel to uproot these elderly people from their homes and families and familiar surroundings, it must be remembered that we are dealing with an infectious and contagious disease in whose management maudlin sympathy should play no part. The tubercle bacilli from these patients are just as dangerous as those from any other case of active tuberculosis. The danger of their disseminating disease is considerably greater, because many of them are careless in their habits and will not co-operate or use the ordinary sanitary precautions which other patients rapidly learn. These patients should be admitted to the sanatorium where they may be isolated, thoroughly studied and adequately treated, for home treatment of tuberculosis is frequently nine parts home and one part treatment. It is almost impossible to keep children away from their favorite grandfather who will still slip them candy from his pocket and tubercle bacilli with it.

Modified bed rest.—Previous treatment programs which placed so much reliance on strict bed rest have never been particularly good for the elderly patient. Prolonged immobilization in bed, in spite of good nursing care, frequently results in decubitous ulcers, contractures, and fixation of joints already stiffened by arthritis, hypostasis and embolic phenomena, all detrimental to the aged patient.

Modern treatment with specific anti-tuberculosis medications no longer requires such strict bed rest, and while a modified restriction of activities is

probably advisable, these patients should be kept ambulatory at least to the extent of bathroom privileges if at all possible, perhaps even to a certain extent during the febrile period of their illness.

Specific anti-tuberculosis therapy.—Specific drug or antibiotic therapy in the chemotherapeutic era has added much to the therapy of tuberculosis, but probably more to this group than to any other. Drug therapy in the aged should be just as intensive and along the same lines as utilized in other patients with tuberculosis. Some concessions may have to be made, however, in some cases as in the younger group. The emaciated person with poor gluteal muscles may not tolerate repeated Streptomycin injections, whereas the patient with a poor appetite, digestive disturbance, or a previous gastric resection may be a poor candidate for large doses of PAS. Most remarkable changes may occur in the disease in some of these people, indicating that some of the lesions are of recent origin and are not the old chronic fibrotic lesions which we once thought existed in many of these patients. In no other group has extremely prolonged chemotherapy found a better place than in the treatment of the aged, for, if such a patient may be kept symptom-free and culture-negative, he may perhaps with safety be returned to his home, to the home for the aged or a rest home, even if he must be kept on chemotherapy for the remainder of his life. Not infrequently the problem of resistant organisms may be encountered in these patients as it will in others who have had previous or inadequate chemotherapy. This will have to be met by the substitution of other antibiotics to which the organisms are still sensitive.

Complete study of the individual.—A complete and careful study of the entire patient is especially important in this group, for elderly people are more likely to have other ailments in addition to the pulmonary tuberculosis. Unless all such factors are realized and evaluated, no true estimate of the patient's true condition or his ability to withstand any contemplated additional procedure can be ascertained. A complete history and physical examination are, of course, fundamental. Complete blood and urine studies are routine. A complete cardiovascular workup including blood pressure, electrocardiogram, and, perhaps, venous pressure and circulation time are essential if any

surgery is contemplated. Old age and pulmonary disease add to the burden the heart must carry and any additional thoracic surgery may add very materially to the load. Renal function studies and at times liver function studies may also be advisable. Pulmonary function studies are extremely important if the inroads of age and disease are to be ascertained, for any surgical intervention will inevitably interfere with this respiratory function. Bronchial spasm, asthma, emphysema, fixation of chest wall by arthritis or the diaphragm by age, adhesions or previous surgery may be important factors in the patient's ability to tolerate any contemplated surgery. The timed one-second and total vital capacity, maximum breathing capacity, exercise tolerance to walking or climbing and at times bronchspirometry may be necessary in order to get a complete evaluation of local conditions.

X-ray studies, both in the posterior-anterior and lateral projections, over-exposed films, planigrams and perhaps bronchograms may be essential to a proper evaluation of the pulmonary lesion. Bronchoscopy, local biopsy and collection of specimens by aspiration for careful microscopic study for malignant cells and culture of the material for secondary organisms, fungi, and tubercle bacilli, may be essential. It becomes the duty of the clinician in charge, with all of this information available, to evaluate it and to make the decision whether surgical intervention is advisable or necessary.

Surgery.—Many patients in the older age group present disease which does not clear completely under conservative measures plus chemotherapy. They may present conditions which in younger persons would immediately be accepted as suitable lesions for collapse or surgical excision. Before pneumothorax had fallen into disfavor, numbers of these people in the older age group were successfully treated by this means. Now with specific drugs available to control the tuberculous complications previously encountered, it may still be used to advantage in certain older persons not suitable for the more drastic types of therapy.

The idea of collapse therapy for our older patients is not new, nor is its application to this group a new departure. The first thoracoplasty carried out at Glen Lake Sanatorium in 1922 was on a sixty-four-year-old man, who not only survived the procedure but was rehabilitated to

TABLE III. AGE DISTRIBUTION OF RESECTIONAL SURGERY IN PATIENTS OVER AGE FIFTY

	50-54	55-59	60-64	65-69	70-75	Total	Per Cent
Male	24	21	12	8	2	68	54.8%
Female	17	21	12	6	1	56	45.2%
Total	41	42	24	14	3	124	100.0%
Per Cent	33%	33.9%	19.4%	11.3%	2.4%	100%	

TABLE IV. DISTRIBUTION OF RESECTIONAL SURGERY IN PATIENTS OVER AGE FIFTY

	Male	Female	Total
Pneumonectomy	5	8	13
Lobectomy	19	14	33
Partial lobectomy	41	34	75
Bilateral resections	3	0	3
Total	68	56	124

useful work and survived for eighteen years, eventually dying of arteriosclerotic gangrene of both feet. Many others have been carried out over the years, were fairly well tolerated and gave some very satisfactory results. They might still be performed to advantage today in certain individuals. Extra-pleural, or more preferably extra-periosteal plombage, might be used to advantage occasionally, as it possesses the advantage of maximum collapse for one procedure without the disadvantage of chest wall motion from thoracoplasty of comparable degree. Even when such procedures prove inadequate after they are carried out, they may still be of value in setting the field for subsequent resection if it becomes indicated. The possibilities of surgical resection of residual significant cavitary or symptom-producing disease has always been a tempting one to the surgeon, but it has been necessary to exercise caution and establish certain limits with this type of treatment in older people. The general surgeons have taught us that it is perfectly possible to repair hernias, plate or pin fractured hips, and perform abdominal surgery on patients of almost any age, even those one hundred or more years old. These procedures, of course, do not upset the cardiorespiratory physiology the way intrathoracic surgery does. The thoracic surgeon works much closer to "where people live" than the general surgeon, and his procedures are more hazardous to the older individual than the major surgery of the abdomen, pelvis, or skeletal structures.

Under certain circumstances the possibilities of using some of the older forms of collapse therapy

now out of style might be considered to control tuberculous disease. Pneumothorax, phrenic nerve operations, and some of the extrapleural or extrapariosteal procedures, usually well tolerated even by poor risk patients, might at times be used to advantage in this group. We do not consider them as reliable as the resectional procedures, but occasionally they may be of a distinct help. During the past decade we have performed resectional surgery on 124 patients beyond the age of fifty up to and including two who were seventy-five years of age, as shown on Table III.

The procedures carried out included thirteen pneumonectomies, thirty-three lobectomies, seventy-five partial lobectomies, with three bilateral resections as shown in Table IV.

This group has included eight diabetic patients (6.5 per cent) ranging in age from fifty-seven to sixty-nine. There were ten Indians (8 per cent) ranging in age from fifty to seventy-five. The operative mortality has been satisfactorily low (2.4 per cent); there were three deaths within the two-month period following surgery: one woman, aged sixty-one, two days after right middle and upper lobectomy under thoracoplasty, from coronary occlusion; one woman, aged sixty-three, on the day of pneumonectomy and six-rib thoracoplasty, from pulmonary edema; one man, aged fifty-four, sixteen days postoperatively, following a left partial upper and lower lobe lobectomy, from a pulmonary embolus. One additional patient, a man aged sixty-seven, who had had bilateral partial resections with partial thoracoplasties, died six months following his last surgery from gradual decline. His tubercle bacilli were resistant to many of the antibiotics. He had tolerated his operative procedures surprisingly well.

The complications encountered have been similar to, and no more frequent than in, the total resection series, and have been more closely related to bacterial resistance than to patient age or the disabilities of age.

It is often physically impossible and more frequently surgically inadvisable to attempt to re-

sect all tuberculous disease in these elderly patients. Our surgical attack should be directed at removal of significant residuals, caseous abscesses, open or inspissated cavities, symptom-producing bronchiectatic areas, leaving old scarred and fibrotic nodular disease areas of smaller size undisturbed. There is little virtue in excising so much pulmonary tissue that the patient is left a respiratory cripple without sufficient capacity to enjoy life. Our aim should be to remove symptom-producing and bacteria-dispersing lesions so that the patient no longer is infectious or dangerous to those around him and may safely be returned to ordinary living conditions.

Because of extensive emphysematous changes so frequently found in these people, special precautions must be taken in resecting these lesions to prevent serious air leakage and persistent pneumothorax postoperatively. When resecting localized lesions from such lungs, the clamp-and-suture method of excision more satisfactorily controls air leakage than the conventional segmental resection.

Care must be exercised in the handling of these elderly patients to avoid even short periods of cyanosis, if myocardial or cerebral damage is to be avoided. Oxygen must be used frequently. Fluctuations in blood pressure, either up or down, must be anticipated and prevented if complications are to be avoided. The legs must be wrapped and early and persistent active motion of the lower extremities insisted upon in an attempt to prevent venous stasis, thrombosis or embolic phenomena. Efficient nursing care with kindness, encouragement and assistance in their coughing and moving are especially important for this group of patients.

Much can be accomplished by intensive treatment, chemotherapy and the judicious use of surgical procedures in the management and rehabilitation of the elderly tuberculous individual. The extra care and attention required in the treatment of these patients will be more than amply repaid by the results which can be obtained in treating them.

TUBERCULOSIS CONTROL

Until recently the emphasis of tuberculosis control programs has been centered on mass surveys, mobile roentgenographic units, and hospital admissions, while a segment of the population with one of the highest rates of infection has been somewhat neglected. Continuous case-finding programs in prisons offer a fertile field for the control of tuberculosis for several reasons.

The increased prevalence rate of the disease in prisoners makes such programs much more rewarding than are those which are carried out in the general population.—HARVEY I. MEYERS, M.D., GEORGE JACOBSON, M.D., and FRANK W. OECHSLI, M.D., *Am. Rev. Tuberc.* (Oct.) 1956.

Cutaneous Manifestations of the "Carcinoid Syndrome"

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THE CARCINOID syndrome recently has become popularized by the work of Rosenbaum,¹ Isler,² Thorson³ and their co-workers. Its manifestations are protean but, since one of its earliest and chief symptoms may be dermatologic, a review of the cutaneous changes seems justified.

The syndrome, as described by Thorson et al,³ consists of the following five components:

1. A slowly growing, malignant carcinoid of the small intestine with metastases to the liver or other, especially intra-abdominal, organs. Dependent edema, change in bowel habits, occasional episodes of ileus and abdominal pain may occur secondarily. Ascites and pleural effusion occur less frequently.

2. General dilatation of the small vessels of the skin and, in some cases, telangiectasia are present.

3. Plethoric coloration and generalized or blotchy cyanosis in the absence of polycythemia have been observed, as has peculiar, patchy flushing of the skin.

4. Pulmonary stenosis of the valvular type and tricuspid regurgitation may be associated with the aforementioned findings.

5. Finally, the patient may complain of atypical attacks of bronchial asthma.

Lubarsch⁴ first described the carcinoid tumor and distinguished it from the more common adenocarcinoma of the small bowel. Bunting⁵ commented on the histologic resemblance of the tumor to a basal cell carcinoma, while Oberndorfer⁶ first used the term "carcinoid" to describe this new-growth.

Carcinoid tumors are most commonly found in the small intestine, although all parts of the gastrointestinal tract below the esophagus, including the gall bladder and appendix, may be involved. Reported extra-alimentary sites include the ovaries and lungs. The tumors are composed of argentaffine cells which are normally found in these various organs. Masson demonstrated the same silver staining characteristics of both the argentaffine cells of the gastrointestinal mucosa, and the cells of the carcinoid tumor, hence the

synonym argentaffinoma. It has also been shown that these cells have an affinity for chromium, and therefore are often referred to as chromaffin cells. Macroscopically, the tumor is firm, rubbery and of a pale yellow color. Microscopically, the growth is composed of small, irregular solid masses of cells supported by a scant connective tissue stroma. The cells have poorly defined cytoplasmic borders and dark basophilic nuclei, which are round and vesicular. Many cells show vacuoles in the cytoplasm, apparently containing a lipoid substance. The cytoplasm also contains specific granules which stain with silver or chromium salts, as well as with eosin.

The argentaffine cells secrete both serotonin (5-hydroxy-tryptamine) and glucagon. Serotonin appears to play a definite role in the development of this syndrome and may also be found outside the argentaffine cells, adsorbed to platelets, in the spleen, brain, glandular tissue, and in the tumor itself. It is normally excreted in small amounts in the urine of humans and dogs. Serotonin is broken down by mono-amine oxidase into a metabolite (5-hydroxy-indole-acetic acid) (5-HIAA) which is excreted in the urine in high amounts in cases of proved carcinoid tumors.

Several hypotheses have been advanced by McKusick⁷ concerning the physiologic actions of serotonin.

1. It is a factor in hemostasis by production of vasoconstriction.
2. It contributes to the control of vascular tone and therefore of arterial blood pressure.
3. It plays a role in the normal function of the central nervous system.
4. It participates in the regulation of renal function.
5. It helps to regulate normal intestinal tone.

The chief dermatologic manifestations of the syndrome are as follows:

1. Reddish-blue cyanosis of the face resulting from pulmonary stenosis.
2. Telangiectasia over the central portion of the face.
3. Thickening of the skin and urticaria of the face.
4. The most characteristic symptom is a bright to

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deep purple flush. The flush may be brought on by alcohol, emotion, food, spices, or have no apparent cause. It has an abrupt onset with rapid spread from the neck to the chest and face, including the conjunctivae, and then to the upper arms. There is increased warmth and a burning sensation in the parts affected, with simultaneous bitemporal headache. After one to fifteen minutes the symptoms subside spontaneously, leaving no residuals.

Thorson et al³ divided the flush into four different stages:

1. Diffuse reddening of the face and the neck.
2. Disappearance of the flush, or spread to the trunk and extremities.
3. The flush disappears in a blotchy manner, leaving sharply demarcated, irregular deep red plaques which stand out against the surrounding normal skin. These patches are often surrounded by broad, blanched margins. They may enlarge and coalesce.
4. The final stage is characterized, in addition to the aforementioned lesions, by cyanotic areas of varying intensity and location. The different stages vary in intensity and duration.

The clinical picture is usually diagnostic but laboratory studies may be of aid. The following are readily available:

1. A qualitative colorimetric screening test, described by Sjoerdsma and co-workers,⁸ for 5-hydroxy-indoleacetic acid, employing 1-nitroso-2-naphthol. The technique is as follows: Mix 0.2 ml. of urine, 0.8 ml. of water and 0.5 ml. of 1-nitroso-2-naphthol solution. Then add 0.5 ml. of nitrous acid and mix again. Let stand ten minutes, then add 5 ml. of ethylene dichloride and shake. A positive test is a purple color in the top layer.
2. Roentgenologic examination demonstrates tumors of the gastrointestinal tract.

It must be remembered that only 20 per cent of carcinoid tumors are malignant and this syndrome apparently occurs only in those cases with metastases, especially to the liver. The syndrome, therefore, has a serious prognosis.

Report of a Case

G. B., a white man, aged seventy-one years, was admitted to the Minneapolis General Hospital in January, 1957, complaining of sharp abdominal pain made worse by eating and relieved by belching or vomiting. He stated that the pain had been present intermittently for the past four years, occurring approximately once every two months and lasting twelve to twenty-four hours. In the four weeks prior to his hospitalization, he had almost constant episodes of stabbing pain which radiated to both sides and to his back. He also complained of alternating diarrhea and constipation and a weight loss of twenty pounds.

The physical examination was essentially negative except for prominent telangiectasia and erythema of the bridge of the nose and cheeks. The cutaneous lesions strikingly simulated rosacea. The liver was palpable 3 cm. below the rib margin.

The only abnormal laboratory findings were 35 per cent retention of bromsulphthalein in the blood in sixty minutes and 1+ reaction with quaiac in a sample of stool. A barium enema showed several small diverticuli in the sigmoid portion of the colon. A roentgenogram of the abdomen with the patient upright showed many distended loops of small bowel with gas and fluid in some loops, suggesting a probable obstruction. Subsequent roentgenograms four days later showed essentially the same findings.

An exploratory laparotomy was performed. The cecum and colon were normal but the distal ileum and adjacent mesentery were matted and necrotic. The surface of the liver was studded with numerous firm yellow nodules ½ cm. to 2 cm. in size. The pathologist reported a carcinoid tumor with spread to the mesentery and metastases to the liver.

Following the operation telangiectasia of the face, which had become increasingly more evident while the patient was in the hospital, gradually disappeared and at the time of discharge was only slightly visible.

Summary

Abdominal complaints are usually the first manifestation of the carcinoid syndrome. The cutaneous changes soon become prominent (flushing or telangiectasia). The cardiac signs may not appear until many years later. At present there is no effective treatment.

The cutaneous changes which occur in the carcinoid syndrome resemble rosacea. Gastrointestinal disturbances are also common in both of the disorders. Whether the dilated vessels in rosacea are related to an increased blood level of 5-hydroxy-tryptamine is questionable. In an attempt to evaluate the relationship of rosacea to increased blood levels of serotonin, urine samples from patients with rosacea are being studied to determine their content of 5-HIAA. A further report on this study will be forthcoming.

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Endocrinopathies in Childhood

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BOTH hyperfunction and hypofunction of every endocrine gland *can* and *do* occur in children. Likewise, practically every tumor of endocrine tissue, either benign or malignant, which occurs in adults also occurs in children. Many of these are encountered less frequently in children than in adults, but conversely some of them occur with considerably greater frequency in childhood. Certain endocrinopathies of relatively frequent occurrence in childhood are seen rarely, if ever, in adult patients.

Because of the magnitude of the subject of endocrinopathies in childhood, no attempt will be made to discuss it completely; rather, emphasis will be placed upon outlining a practical approach for the clinician to the evaluation of important endocrine problems in children. This discussion will be confined to a consideration of those endocrine disorders which occur only, or with greatest frequency, in the very young, those in which definitive diagnosis at the earliest possible moment is of great urgency, and those concerning which there are common and important misconceptions among the medical profession.

In this age we all are attempting to practice "scientific medicine." What has been called the "art" of medicine is giving way to what has been called the "science" of medicine. We must remember, though, that the "art" of medicine was practiced effectively only by those who focused on the problems they met a great deal of painstaking care, accurate observation, and *especially* intelligent, thoughtful evaluation. A similar approach is necessary in order effectively to practice the "science" of medicine. It is not necessarily true that the more laboratory procedures a physician orders the more scientific is his practice of medicine. Rather, the physician who is effectively practicing the science of medicine orders all of the laboratory procedures he needs which may be available to him, but orders each one only on

a specific indication. When the results are returned, he evaluates these in a careful and intelligent manner, remembering always that his measurements of height, weight, head circumference, pulse rate, blood pressure, et cetera, also represent precise data and must be given serious consideration in the overall evaluation of the patient. If the result of a certain laboratory procedure is not in conformity with his own observations, he must hold that result in question until he has reconfirmed it or must re-evaluate his thinking about the patient to determine whether or not that result actually does necessarily conflict with his own observations.

Laboratory data must be used only for what they are, i.e., tools to help in the evaluation of the patient. Any tool is only as effective as the man who is using it. The baseball bat in the hands of Mickey Mantle is a very effective tool, but in the hands of most of us it is only a long, cylindrical piece of wood. The scalpel in the hands of the surgeon is a very effective tool, but in the hands of Mickey Mantle it is only an over-sharpened butter knife. There are very many expensive and complicated laboratory procedures for evaluation of endocrine function; most of these are available only at certain referral centers and many of them are notorious for their unreliability. Therefore, in this field it becomes especially important for the clinician to have a thorough basic knowledge of fundamental principles and to develop to the utmost his clinical proficiency, thereby decreasing to a minimum the number of hormone assays and other laboratory procedures needed to verify or clarify his clinical impressions.

In the evaluation of laboratory data concerning the child suspected of having an abnormality of endocrine function one basic and well-known principle must always be remembered, i.e., that almost all biologic phenomena can be represented by the "normal distribution curve." But, do physicians remember this in the evaluation of patients, especially in the evaluation of laboratory data?

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TABLE I. EVIDENCES OF ENDOCRINE ABNORMALITIES
IN CHILDREN

1. Accelerated or retarded somatic growth
2. Accelerated or retarded bone age
3. Accelerated or retarded sexual development
4. Retarded mental development
5. Specific findings characteristic of individual endocrine abnormalities.

For example, as applied to endocrinopathies in childhood, regardless of which objective criteria are being studied—whether it be height, weight, bone age, occipito-frontal circumference, pulse rate, intelligence, serum calcium, protein-bound iodine, urinary 17-ketosteroids, the age at appearance of sexual hair, the histologic findings on testicular biopsy, the age at onset of menses, or the results of an insulin response test—the data must be evaluated in terms of the principle illustrated by this curve. If a large enough series of individuals is studied with regard to any one of these criteria, the results will be found to distribute themselves around a mean in accordance with the mathematical expression corresponding to this curve. Just a moment's reflection upon this fact makes it apparent that it is utterly impossible—and most unscientific to attempt—to state precisely the upper or the lower limit of "normal" for any given measurement. However, one can state quite precisely what the chances are that a given value would occur in a random sampling of the population at large. The laboratory has no right to report a value as "abnormally low (or high)"; rather the report should state "the chances are such and such that this value is abnormal."

Hypofunction and hyperfunction of endocrine glands are not all-or-none phenomena. As one would expect, it is much more common to obtain data indicating "borderline" function than it is to obtain data indicating almost certain abnormality. The physician is not being any more scientific if he concludes that all patients with these "borderline" values are normal than he is if he concludes that they all have endocrine abnormality. The physician's stock-in-trade is his *educated brain*. The reason the patient does not go directly to the commercial laboratory, have a battery of tests done, and be handed a slip of paper stating his diagnosis is that it is presupposed the physician will *think* about the laboratory results and evaluate them in relationship to the mass of other information about the patient which he has available.

Clinical Evidence of Endocrine Abnormalities in Children

How then does one suspect the existence of an endocrine disorder in a child? As shown in Table I, the early indications in children are considerably different than in adults. The child is a developing organism and the rate and sequence of his development are to a considerable extent under endocrine control. Accordingly, in a great many instances, the first clinical evidences of endocrine abnormality are those provided by abnormalities in the child's development. These include delay in mental development and delay or acceleration of somatic growth, epiphyseal maturation, and sexual development. The last three of these—somatic growth, epiphyseal maturation, and sexual development—are intimately inter-related. Quite commonly in any situation in which there is acceleration or delay of one of these, there is a similar deviation of the others from the expected developmental pattern. On the other hand, mental development does not appear to bear such an intimate relationship to any of these. Mental retardation is quite commonly found in association with severe impairment of development in somatic growth, epiphyseal maturation, and sexual maturation, but frequently occurs in the absence of these latter; and conversely, the latter frequently occur in the absence of mental retardation. Also, patients with advanced physical maturation seldom have correspondingly advanced mental development.

Of course, alterations in developmental patterns require at least months and usually years to manifest themselves clearly. Often it is possible and even quite urgent to diagnose endocrine abnormalities in children before time enough has elapsed to permit definitive alteration in developmental patterns. For example, the child with diabetes mellitus often presents himself to the physician in acidosis and coma as the initial manifestation of his disease. In retrospect, there may have been some mild preceding symptoms, but none alarming enough to have prompted the parents to consult the physician. In the converse situation, the child with hypoglycemia may be brought to the physician for the first time during or following a convulsion or loss of consciousness due to hypoglycemia. The child with a pheochromocytoma well may have and usually does have such severe symptoms that the diagnosis is made or death ensues before there has been

time for his disease to be reflected in his developmental pattern. This observation is equally true of the child, and especially the infant, with adrenal insufficiency. As will be mentioned later, the female with congenital adrenal hyperplasia should be recognized at birth by the alert physician. Unfortunately, this diagnosis usually is not made, and these patients who are female pseudohermaphrodites are considered to be males with hypospadias and cryptorchidism until many months or even a few years have elapsed, when they begin to show obvious signs of advanced development in somatic growth and sexual and epiphyseal maturation. At this time, the embarrassed doctor must confront the parents with the catastrophic announcement that the child is really a girl and that they now are faced with the dilemma of either changing the child's sexual role or permitting her to continue through life as a grossly abnormal male.

A sound knowledge of the manifestations of specific endocrine disorders is mandatory for the diagnosis of such disorders in children, just as it is for diagnosis in adults. However, in evaluation of possible endocrine abnormalities in children, the clinician has at his command some additional and very valuable criteria which are of little value in adults. Somatic, sexual and mental development can be evaluated with no "hocus-pocus" and with no complicated laboratory procedures. They require only careful observation on the part of the physician, a knowledge on his part of normal developmental patterns, and an alertness concerning the significance of deviations from these norms. A simple x-ray of the wrist and comparison of the film with standard tables of epiphyseal development will yield a reasonable estimate of bone age. If no specific findings characteristic of individual endocrine abnormalities and no gross abnormalities in somatic, sexual, epiphyseal, or mental development are observed, the chances of significant endocrine disorders existing are quite remote.

Mechanisms of Endocrine Homeostasis

The present concept of endocrine homeostasis is that this represents an extremely complicated process. As indicated in Figure 1, it appears that the central nervous system, probably the hypothalamus, is intimately involved in the regulation of all or nearly all of the endocrine glands. By some mechanism—and there still is some disagree-

ment as to whether these mechanisms are neural or humoral—the hypothalamus stimulates the pituitary, the heretofore so-called "master-gland," to secrete its appropriate tropic hormone. This

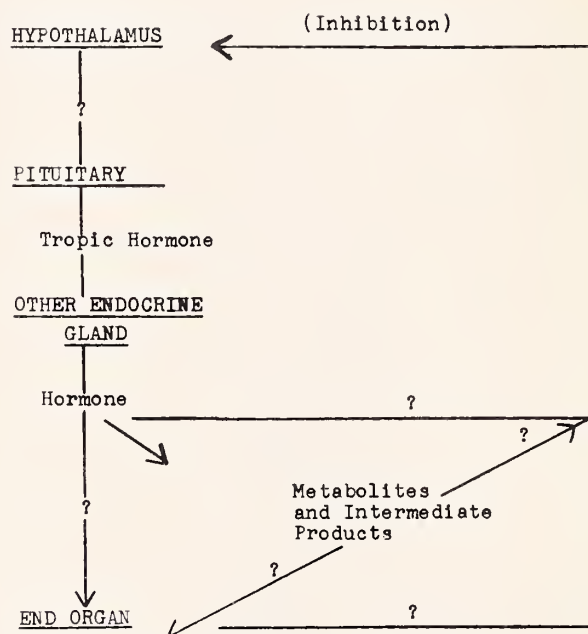


Fig. 1. General scheme for endocrine homeostasis.

hormone in turn stimulates the corresponding endocrine gland to produce its hormone or hormones. In view of recent studies, there now appears to be a strong likelihood that all endocrine glands produce more than one physiologically active substance, and consequently that the field of endocrinology is even much more complicated than previously it was thought to be. The hormone secreted by each gland is in turn metabolized to a variety of intermediates and end-products; the hormone itself as well as any of these derivatives may influence various end-organs or tissues. Two active compounds produced by one gland may be similar or antagonistic in the tissue response which they elicit.

Homeostasis is achieved by virtue of the fact that the products of each endocrine gland by some little understood mechanism are able to inhibit the release of additional hormone by that gland. In some instances, this may be accomplished by inhibition of the hypothalamus when some critical concentration of the hormone in the circulation is attained. In other instances, it appears that certain metabolites of the hormone are of key importance in producing inhibition; and in still other instances, the end-organ re-

TABLE II. BASIC CAUSES OF DELAYED MATURATION
Somatic, Sexual, Epiphyseal

-
1. Hypothalamus
 2. Specific Endocrine Abnormalities
 3. Abnormal Metabolism of Hormones
 4. Abnormal End-Organ Responses
 5. Chronic Disease
-

sponse to the hormone produces physiologic effects, which in turn cause inhibition of release of that hormone and/or stimulation for the release of an antagonistic hormone.

In addition, there are known to exist certain inter-relationships among the hormones produced by different endocrine glands. For example, thyroid hormone is known to increase the rate of metabolism of adrenocorticosteroids. These steroids, in turn, are known to inhibit the production of thyroid hormone. Progesterone not only is the principal hormone produced by the corpus luteum, but also is an intermediary product formed by the adrenal cortex in the process of steroidogenesis. In view of these and many other known direct interactions of the products of different endocrine glands, one no longer can think of the pituitary as *the* master gland in the classic sense. To some extent, in all probability, the function of each endocrine gland affects the function of every other endocrine gland.

Causes of Delayed Somatic, Sexual, and Epiphyseal Maturation

Table II shows a classification of the causes of delayed somatic growth and sexual and epiphyseal maturation. The hypothalamus may be the site of the basic abnormality. This is commonly assumed to be the mechanism of the delayed maturation seen in such syndromes as Froehlich's Syndrome and the Laurence-Moon-Biedl syndrome.

Specific endocrine abnormalities are responsible in certain endocrinopathies. Pituitary abnormalities classically are considered to play an important role in producing delayed maturation. Without doubt, in those patients with generalized pituitary deficiency there results a delay in somatic, sexual and epiphyseal maturation. The pituitary dwarf is a real entity, but this diagnosis is one which is made much too frequently and is not justified unless there is evidence of generalized pituitary deficiency, including hypofunction of the adrenal and thyroid glands as well as evidence of delayed growth and maturation. Whether or not a specific growth hormonal deficiency exists in many

so-called pituitary dwarfs is a moot question and must remain so until a satisfactory assay for growth hormone is devised. At the present time, although this is assumed by many to be a common cause of growth failure, there is little direct evidence to support this concept.

Either hyperfunction or hypofunction of the thyroid, the adrenal or the pancreas may cause delayed growth and maturation. Classically, this effect has been considered to be produced by inhibition of the pituitary. In the entire field of pediatric endocrinology, one of the most common misconceptions among physicians is that hypothyroidism is a common cause of delayed growth and maturation in the young child. Certainly, most hypothyroid children have delayed growth and retarded bone age, but only a relatively small proportion of children with these findings have hypothyroidism. This diagnosis should never be made on the sole basis of retarded growth and bone age development in the absence of the other characteristic clinical manifestations and/or laboratory confirmation.

Abnormal metabolism of hormones, after their formation, may result in a failure to produce effective stimulation of the end-organ and therefore may result in delayed maturation.

Abnormal end-organ response may be the cause of delayed maturation. The classic example of this is the "Seabright-Bantam Syndrome" or pseudohypoparathyroidism, which occurs because of insensitivity of the end-organ response to parathyroid hormone.

Chronic disease—whatever the type—is a common cause of developmental retardation. The responsible mechanism in this instance usually is considered to be secondary pituitary inhibition. Whether or not this is a justifiable interpretation is open to question.

Hypogonadism*

This is a diagnosis that seldom should be made in a child. Actually, all children have hypogonadism until the onset of pubescence. The age at the onset of pubertal changes may vary quite extremely, occurring as late as the twenty-second year, in individuals who eventually mature into normal adults. For this reason it is extremely difficult to decide at what age to institute en-

*In preparing this and subsequent sections concerning abnormal sexual maturation, the author has followed closely the classification presented by Wilkins.¹

docrine therapy in an attempt to hasten sexual and somatic maturation. This often can be accomplished, but whether or not it should be undertaken is a question that must be decided in each individual patient on the basis not only of physical but also of emotional and psychiatric aspects of the case. For the small, underdeveloped 'teen age boy who is emotionally maladjusted because of his slow development, there is little consolation in the statement that he eventually will mature into a normal adult. Even though he does eventually mature normally with regard to sexual and somatic development the delay in this maturation well may have left permanent emotional scars which prevent him from ever becoming an entirely normal person.

Neurogenic causes of sexual infantilism in the male and female are manifest in both the Froehlich's syndrome and the Laurence-Moon-Biedl syndrome. Both of these syndromes are characterized by obesity and stunted growth. *Pituitary causes of sexual infantilism* are the same in both sexes, and include panhypopituitarism, specific growth hormone deficiency, and specific gonadotropic deficiency. Panhypopituitary dwarfs and those patients with specific growth hormone deficiency have stunted growth. Patients with specific gonadotropic deficiency may be normal in stature or may be tall and eunuchoid. *Gonadal causes of sexual infantilism* are those that have to do with failure of the gonads to develop, i.e., gonadal dysgenesis (or the so-called Turner's syndrome), testicular dysgenesis, and arrested development of the ovary. In these conditions, growth is stunted, but usually the features are mature and epiphyseal development is normal. Prepubertal castration in either sex results in tall, eunuchoid stature. Degeneration of gonads from trauma, disease, x-ray irradiation, et cetera, in either sex results either in normal or in tall, eunuchoid stature, depending upon the age at which the degeneration occurred. In the male, gynecomastia may be present in association with the Klinefelter syndrome or other conditions with testicular degeneration.

In general, urinary follicular stimulating hormone (F.S.H.) are low in those individuals with hypogonadism based on hypothalamic or pituitary abnormalities, and elevated in those whose primary site of abnormality is gonadal. However, it must be remembered that F.S.H. usually is not detectable in children before the age of puberty,

and therefore this determination is of no value in the young child and of little worth in any person in the pediatric age range unless a high excretion value is observed.

The importance of testicular biopsy in the differential diagnosis of male hypogonadism should be emphasized. In patients with primary pituitary lesions, testicular biopsy reveals simply an immature prepubertal testis. On the other hand, in testicular dysgenesis of the del Castillo type both Sertoli cells and Leydig cells are present but germinal epithelium is absent and the tubules are composed of Sertoli cells only. In the Klinefelter syndrome the tubules are hyalinized and neither germinal epithelium nor Sertoli cells are present. In castration, of course, whether due to absence or atrophy of testes, the Leydig cells are absent, along with the germinal epithelium and Sertoli cells. Testicular biopsy is the one most useful diagnostic procedure in the adult or older child. It is of little or no value, however, in the young child.

All of these categories of patients have very small testes and azospermia. As mentioned before, F.S.H. is low in those with primary pituitary lesions and elevated in those with primary gonadal lesions. Androgenic manifestations approximate normal in those patients with no or little involvement of Leydig cells. Urinary 17-ketosteroids in large part reflect adrenal function as well as testicular. Therefore, they are very low in the patients with primary pituitary lesions and, at most, moderately reduced in those with primary gonadal lesions. If Leydig cells are intact, 17-ketosteroids well may be normal in patients with testicular pathology, that is, in testicular dysgenesis of del Castillo and in Klinefelter's syndrome. Gynecomastia may occur either in Klinefelter's syndrome or in castrates, but is not a consistent finding in either.

Sexual Precocity in Females

Sexual precocity in females may be neurogenic, idiopathic, or gonadal in origin. In Wilkin's series,¹ 70 per cent were idiopathic in type. Of the remainder, half were neurogenic and half gonadal in origin. Both neurogenic and idiopathic types apparently result from early activation of the pituitary to stimulate the development of sexual maturation in the usual manner. Thus, the ovaries mature normally, ovulation may occur, and sex hormones are excreted in normal

TABLE III. ROLE OF ADRENAL FUNCTION IN DETERMINING ABNORMAL SEXUAL MATURATION

I. Delayed Sexual Maturation
A. Chronic adrenal insufficiency
B. Cushing's syndrome
II. Advanced Sexual Maturation
A. Adrenal tumor
1. Virilizing adrenal tumor
2. Feminizing adrenal tumor
B. Congenital adrenal hyperplasia
1. In female:
a) Pre-natal: Female pseudohermaphroditism
b) Post-natal: Virilism
2. In male: Macrogenitosomia precox

adolescent amounts. Many types of neurogenic lesions have been implicated: some brain tumors, encephalitis, congenital defects of the hypothalamus, and Albright's syndrome (polyostotic fibrous dysplasia), which is characterized by fibrous areas of decreased density in the long bones and advanced sexual maturation. It seems important to emphasize that only 15 per cent of all cases of advanced sexual maturation in the female are due to ovarian tumors and that these patients, in contrast to those with central lesions, do not progress in an orderly fashion through the usual stages of maturation, but rather have rapid and spotty manifestations of advanced sexual development. One other cause of symptoms of advanced sexual maturation in the female, which occurs more frequently than one might expect, is the ingestion of estrogens. In these children the areola of the breast becomes heavily pigmented, there is a sudden growth of pubic hair, and bleeding may occur in rapid succession. This series of events may prove extremely frightening to the parents until its cause is determined.

Sexual Precocity in Males

Sexual precocity in males may be neurogenic, idiopathic, gonadal, or adrenal in origin. Neurogenic and idiopathic types, as in the female, lead to an orderly pattern of sexual development on an accelerated schedule. The testes mature normally, spermatogenesis may occur, and male sex hormones are excreted in normal adolescent amounts. Gonadal pathology causes only 5 per cent of all cases of advanced sexual development in the male. As these tumors usually involve only one testis, with the other being immature or atrophic, careful physical examination often may lead to a correct clinical diagnosis. Spermatogenesis does not occur, but sex hormones are excreted in excessive amounts.

Advanced sexual maturation of adrenal origin in the male may be due to tumor or to adren-

al hyperplasia. In either case, the testes are usually small and immature, there is no spermatogenesis, and androgens are excreted in excessive amounts. In those patients with adrenal hyperplasia, adrenal insufficiency often may be evident.

Heterosexual Development

The types of heterosexual development may be considered to be two: (1) sex reversal, or (2) intersex. *Sex reversal* in the female occurs with congenital adrenal hyperplasia which has its onset during embryonic life. These patients are female pseudohermaphrodites. They have ovaries and complete or partial female internal sexual structures, but the external appearance of males with a urogenital sinus and enlarged phallus. These patients exhibit excessive growth, increased bone age, precocious development of sexual hair, increased 17-ketosteroid excretion, and the early development of male secondary sexual characteristics.

In those female patients with adrenal tumor, arrhenoblastoma, or adrenal hyperplasia with its onset after birth, *virilism* results. The phallus enlarges and 17-ketosteroid excretion increases. If they are young enough at the time of onset, they exhibit excessive growth, increased bone age and precocious development of sexual hair.

Sex reversal occurs also in the male with a feminizing adrenal tumor. At the time of birth these patients have no abnormality, but later they develop feminization often with considerable gynecomastia. They do not have excessive growth, increased bone age, precocious sexual hair, or increased 17-ketosteroid excretion.

True intersexes may be true hermaphrodites or male pseudohermaphrodites. The true hermaphrodites are those with mixed gonads—either one ovary and one testis or with one or each gonad being an ovo-testis. Male pseudohermaphrodites have external features of females but their gonads are testes. Neither of these groups of patients have excessively rapid growth and maturation or increased 17-ketosteroid excretion. Female pseudohermaphrodites, other than patients with congenital adrenal hyperplasia, are extremely rare.

Influence of Adrenal Function on Sexual Development

Table III summarizes several ways—all of which have been mentioned earlier—in which abnormal adrenal function may influence sexual maturation. Delayed sexual maturation may result from either

chronic adrenal insufficiency or chronic overproduction of adrenal steroids of the 17-hydroxycorticosteroid type such as occurs in Cushing's syndrome. Advanced sexual maturation may result

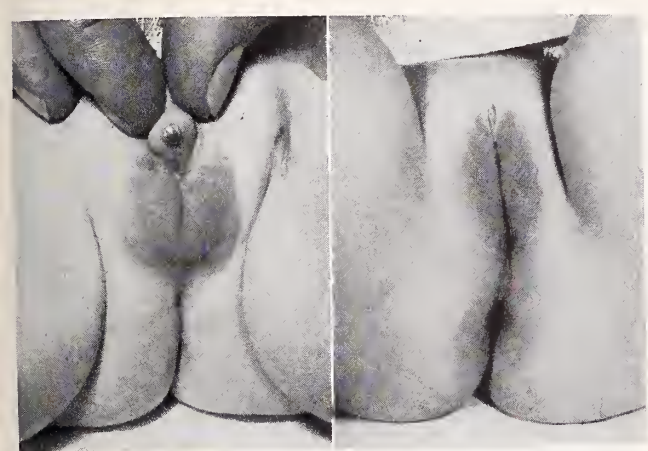


Fig. 2. Genitalia in female pseudohermaphroditism: (a) before plastic repair; (b) after plastic repair.

either from tumor or hyperplasia of the adrenal. Tumors may be either virilizing or feminizing and may cause either isosexual or heterosexual development.

Adrenal hyperplasia in the female produces pseudohermaphroditism if present by the third to fifth fetal month. If it occurs later or after birth, it produces virilism. Adrenal hyperplasia in the male produces the syndrome known as macrogenitosomia precox, which consists of advanced growth and sexual development according to an isosexual pattern. With adrenal hyperplasia in both males and females there is early masculinization, excessively rapid somatic growth, and accelerated epiphyseal maturation. However, because of the accelerated epiphyseal maturation, growth ceases at an early age and in many cases the patient becomes a somewhat stunted adult.

The typical appearance of the female pseudohermaphrodite with enlarged chordee phallus, and urogenital sinus is illustrated in Figure 2a. This appearance of the external genitalia is pathognomonic of congenital adrenal hyperplasia and permits the diagnosis of this condition at birth. Furthermore, when this typical anatomic configuration is present, one need not be concerned about adrenal tumor, since these have not been reported to occur as early as the third to fifth fetal month as would be necessary to cause this developmental anomaly. Figure 2b shows the excellent result of plastic repair in the female—

TABLE IV. PITUITARY-ADRENAL HORMONE PATTERNS IN CONGENITAL ADRENAL HYPERPLASIA

Hormone Type	Pre-Therapy	During Cortisone Therapy
17-ketosteroid (Urine)	High	Normal
17-hydroxycorticosteroids (Urine) (Plasma)	Low Low	Normal Normal
ACTH (Blood)	High	Normal

one year after operation. This plastic repair is a simple operation which should be done as early as possible and usually can be accomplished as a one-step surgical procedure.

Biochemical Abnormality in Congenital Adrenal Hyperplasia

Table IV shows typical hormone patterns in untreated patients with congenital adrenal hyperplasia and the influence of cortisone therapy on these patterns.² It long has been known that patients with congenital adrenal hyperplasia produce excessive amounts of 17-ketosteroids. This formerly was interpreted as an indication of generalized hyperfunction of the adrenal cortex. Quite the opposite, however, is true; these patients have a segmental adrenal insufficiency and are unable to produce normal amounts of 17-hydroxycorticosteroids. This latter group of steroids includes compound F, the major steroid produced by the normal human adrenal cortex. Homeostasis of adrenal function is dependent upon the intermittent inhibition of pituitary release of ACTH; this results when blood concentrations of 17-hydroxycorticosteroids attain some critical level. In patients who cannot produce 17-hydroxycorticosteroids in a normal manner, inhibition fails to occur and ACTH is overproduced. This in turn causes overstimulation of the adrenal cortex and overproduction of 17-ketosteroids, as well as histologic hyperplasia of the cortex. As shown in the pretherapy column, blood ACTH levels and urinary 17-ketosteroid excretion are high, but both plasma and urinary 17-hydroxycorticosteroids are extremely low. During therapy with cortisone, this pattern reverts to normal, since cortisone is a 17-hydroxycorticosteroid and furnishes ideal substitution therapy.

The biochemical abnormality of the adrenal cortex in patients with congenital adrenal hyperplasia has been defined clearly in recent years. Figure 3 shows a simplified representation of the

chemical steps involved in steroidogenesis by the adrenal cortex.^{3,4} Compound F (17-hydroxycorticosterone) and compound B (corticosterone) are the principal end-products of steroidogenesis

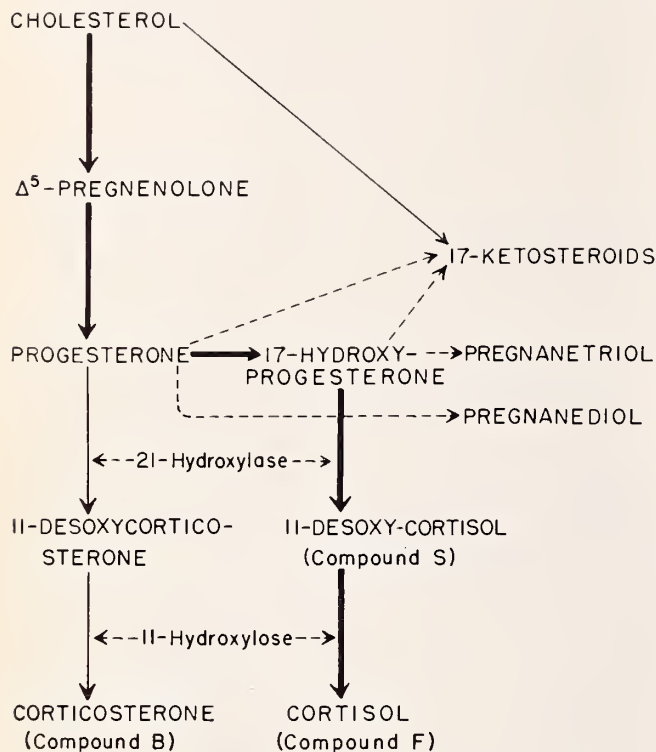


Fig. 3. Steroidogenesis by the adrenal cortex. Heavy arrows show the usual principal pathway. Solid lighter arrows show usual secondary pathways. Dotted arrows show alternate pathways which are insignificant in normal subjects. In congenital adrenal hyperplasia, 21-hydroxylase is absent or greatly reduced in quantity thus blocking conversion of progesterone to 11-desoxycorticosterone and 17-hydroxyprogesterone to 11-desoxycortisol and causing increased production of 17-ketosteroids, pregnanediol, and pregnanetriol. In hypertensive type 11-hydroxylase is affected rather than 21-hydroxylase, thus preventing formation of compounds B and F and increasing the end-products of the alternative pathways.

in the normal individual. Among the other end-products of steroidogenesis are the 17-ketosteroids and insignificant amounts of pregnanediol and pregnanetriol.

In patients with congenital adrenal hyperplasia the basic abnormality consists of a deficiency of certain hydroxylating enzymes necessary for the process of steroidogenesis. This deficiency ordinarily is in the 21-hydroxylating enzyme but in occasional patients (hypertensive type) may be in the 11-hydroxylating enzyme.⁵ Because of this enzymatic block the principal end-products of steroidogenesis are the 17-ketosteroids, pregnanediol, and pregnanetriol (or compound S in the hypertensive type) rather than compound F and compound B as in the normal.

TABLE V. LABORATORY DIFFERENTIATION: ADRENAL TUMOR VS. HYPERPLASIA

	Hyperplasia	Tumor
Plasma 17-OHCS	Low	Normal or high
Urinary 17-OHCS	Low	Normal or high
Urinary Beta 17-ketosteroids	Moderate	High
Urinary pregnanediol and pregnanetriol	High	Normal
Plasma 17-OHCS-ACTH response	No change	Increase
Pregnanediol-pregnanetriol ACTH	Large increase	Slight increase
17-keto response to cortisone	Decrease	No change

Because of this enzymatic abnormality, it is possible to make a positive laboratory differentiation between congenital adrenal hyperplasia and adrenal tumor, since patients with tumor do not have similar enzymatic deficiency. As shown in Table V, plasma and urinary 17-hydroxycorticosteroids are low in patients with congenital adrenal hyperplasia and normal or high in patients with adrenal tumor. Urinary beta-17-ketosteroids are moderately elevated in congenital adrenal hyperplasia patients and very high in adrenal tumor patients. Although this is one of the oldest and best-known differential tests, it is the least reliable of those shown in this table. Urinary pregnanediol and pregnanetriol are high in patients with congenital adrenal hyperplasia and normal in patients with adrenal tumor. In response to ACTH stimulation, the plasma 17-hydroxycorticosteroids do not increase appreciably in patients with congenital adrenal hyperplasia but increase normally or excessively in patients with adrenal tumor. Conversely, pregnanediol and pregnanetriol increase excessively in response to ACTH in patients with congenital adrenal hyperplasia but only slightly in patients with adrenal tumor. Finally, the urinary 17-ketosteroids decrease remarkably following cortisone administration for a period of several days in patients with congenital adrenal hyperplasia but not in patients with adrenal tumor.

Endocrine Conditions in Which Diagnosis Is Urgent

Table VI shows a group of endocrine conditions in children in which it is urgent to make the diagnosis at the earliest possible time. These

TABLE VI. URGENT ENDOCRINE DIAGNOSES

Diagnosis	Reason
1. Diabetes mellitus	Imminent death
2. Diabetes insipidus	" "
3. Acute adrenal insufficiency	" "
4. Pheochromocytoma	" "
5. Hypoglycemia	Brain damage and mental retardation
6. Hypothyroidism in infant	" " "
7. Advanced sexual maturation	(a) Danger of malignancy (b) Psychologic implications
8. Heterosexuality	Psychologic implications
9. Congenital adrenal hyperplasia in newborn	(a) Imminent death from dehydration (b) <i>In female:</i> Danger of unnecessary psychologic trauma and family hardship if error made in determination of sex at birth.

include diabetes mellitus, diabetes insipidus, acute adrenal insufficiency and pheochromocytoma, which often may not be discovered until the patient is in imminent danger of death. Hypoglycemia and hypothyroidism in the young infant are diagnoses which must be made as early as possible because, if allowed to remain untreated, they commonly cause brain damage and mental retardation which is irreversible. Conditions causing advanced sexual maturation must be diagnosed as early as possible because of the danger of malignancy and because of the psychologic implications in these conditions. Similar considerations make it necessary to diagnose as early as possible patients with heterosexuality. If the sexual role of such patients must be altered by surgical intervention, this should be done at as young an age as possible because of the psychologic trauma that almost inevitably results in the older child. Congenital adrenal hyperplasia can be diagnosed in the newborn, and this may be a very urgent diagnosis. In either sex, the patient may be in imminent danger of death from dehydration and adrenal insufficiency. In the female, especially, the diagnosis nearly always should be possible at the time of birth because of the characteristic appearance of the external genitalia. It is important that this diagnosis be made because of the unnecessary psychologic trauma to the patient and hardship for the family if an error is made in the determination of the sex at the time of birth.

Endocrine Diagnoses Too Frequently Made

Table VII indicates some endocrine diagnoses which are made too frequently without proper substantiation. Hypothyroidism in the infant is

TABLE VII. ENDOCRINE DIAGNOSES TOO FREQUENTLY MADE

1. Hypothyroidism
2. Pituitary Dwarfism
3. Hypogonadism
4. Froehlich's Syndrome
5. Cushing's Syndrome

a relatively rare condition. All too frequently this diagnosis is made and thyroid therapy instituted in infants who have only mental retardation or delayed somatic or epiphyseal development. Such patients deserve intensive diagnostic study since many of them may have conditions which are amenable to therapy, such as hypoglycemia, phenylketonuria, etc. The initiation of thyroid therapy in such patients accomplishes nothing and frequently causes such a prolonged delay in establishing the proper diagnosis that irreparable brain damage has resulted to the patient in the interim. In this regard, it should be remembered that a basal metabolic rate test is virtually of no value in infants and young children. The diagnosis of hypothyroidism in this age group, or in any child for that matter, should not be made in the absence of confirmatory laboratory evidence of a more specific nature.

As mentioned earlier, pituitary dwarfism and hypogonadism are diagnoses that are extremely hard to verify in the child and are made much too often. Both Froehlich's and Cushing's syndromes are rare but these diagnoses often are considered and all too frequently made without adequate substantiation.

Summary

It has been impossible in this brief presentation to discuss in great detail the subject of endocrinopathies in childhood. An attempt, therefore, has been made to stress a practical approach to the consideration of these conditions and to emphasize how rewarding careful and repeated physical examination and observation of the patient may be in their evaluation. Finally, although definitive diagnosis in endocrine conditions in childhood often may be dependent upon laboratory evaluation, laboratory results alone may be quite misleading unless one is extremely careful in his interpretation of them; if maximum information has been gleaned from the history and physical examination, the number of laboratory examinations required may be kept at a minimum.

(References on Page 804)

Hypercalcemia in Hyperthyroidism

Review and Report of Four Cases

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SIGNIFICANT changes in metabolism of calcium and demineralization and deformities of the skeleton may occur in patients with hyperthyroidism. Since the initial report by Kummer¹ in 1917, numerous publications²⁻⁴ have appeared in which roentgenographic evidence of skeletal changes in patients with hyperthyroidism are described, yet the underlying factors responsible for these changes remain obscure. While the concentrations of calcium and inorganic phosphorus in the serum are usually normal in hyperthyroidism, hypercalcemia and hypercalciuria may occur.

Several cases of severe hyperthyroidism have been reported^{5,6} wherein a clinical course of loss of weight, tachycardia, nausea, vomiting, muscular weakness and fever was associated with hypercalcemia and hypercalciuria. Diagnoses of both primary hyperparathyroidism and hyperthyroidism were considered in these cases, but after the patients were treated for hyperthyroidism they showed marked clinical improvement and the abnormal values for serum calcium returned to normal. The possible coexistence of hyperthyroidism and hyperparathyroidism must be considered in such cases, since at least six cases⁷⁻¹¹ (Table I) had been reported in which both diseases were present. Ball,¹² Hellström¹³ and Meyer-Borstel¹⁴ have each reported a case in which the patient had elevation of the basal metabolic rate, hypercalcemia, and skeletal changes compatible with osteitis fibrosa cystica; but the presence of a hyperfunctioning tumor or of diffuse hyperplasia of the parathyroid gland was not proved in any of the three cases. In Bergstrand's¹⁵ case, necropsy revealed diffuse hyperplasia of the parathyroids and enlargement of the thyroid gland; however, antemortem studies of blood calcium or phosphorus had not been made, although the basal metabolic rate had been elevated.

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Our paper concerns observation of the calcium metabolism in four cases of hyperthyroidism with hypercalcemia and one case of coexisting hyperthyroidism and primary hyperparathyroidism encountered at the Mayo Clinic during the past six years.

Methods

The serum calcium was determined by employing oxalate precipitation and permanganate titration. Values cited in many texts for the normal range of serum calcium are usually 9 to 11 mg. per 100 ml. The mean value for serum calcium in 109 healthy adults in our laboratory by this method was 9.77 mg. per 100 ml. with a standard deviation of 0.31 mg. per 100 ml. The "normal range" including 95 per cent of the normal population so described is 9.2 to 10.4 mg. per 100 ml. The error of the method as indicated by replication is 0.01 mg. per 100 ml.¹⁶ The serum inorganic phosphorus was determined by the method of Gomori.¹⁷

Quantitative studies of the urinary excretion of calcium were made with the patients eating a diet containing 135 mg. of calcium daily. The calcium in the urine was measured by means of precipitation of calcium as oxalate followed by conversion of oxalate to carbonate and acidometric titration of the calcium carbonate so formed. The intravenous calcium-loading test was carried out by the method described by Nordin.¹⁸

Report of Cases

Case 1.—A thirty-seven-year-old white man came to the clinic in January, 1956, complaining of persistent tachycardia and abnormal fatigue of two months' duration. He had been aware of mild intolerance to heat and increased sweating and tachycardia for six months. Tremor of the hands, exophthalmos, or goiter had not been noted. Two episodes of left renal colic had occurred, one in 1949 and one in 1952. Renal calculi had never been passed.

Physical examination revealed a moderately stimulated man with a fine tremor of the outstretched fingers and a radial pulse rate of 120 beats per minute. The blood pressure was 160 mm. of mercury systolic and

TABLE I. REPORTED CASES OF HYPERTHYROIDISM WITH COEXISTING HYPERPARATHYROIDISM

Author	Cases	Basal Metabolic Rate Per Cent	Blood Values (Milligrams Per 100 cc. of Serum)		Roentgenographic Findings	Surgical Findings
			Calcium	Phosphorus		
Ballin and Morse ⁷	1	+27	15.4	1.7	Osteoporosis of spinal column	Two parathyroid adenomas; no mention of thyroid findings—calcified adenoma of thyroid previously removed.
Cooley ⁸	1	+23	13.6 15.2	2.6 3.0	Extensive skeletal demineralization and formation of cysts	Cystic parathyroid tumor; small colloid goiter.
Miller and Evans ⁹	1	+29 +36	17.2	2.5	Slight osteoporosis of skull and femur	Parathyroid adenoma; subtotal thyroidectomy—53 gm. of hyperplastic tissue removed.
Noble and Borg ¹⁰	1	+38 +43	15.0 14.5	2.4 2.6	Extensive osteitis fibrosa	Cystic clear-cell parathyroid adenoma, retromanubrial in location; subtotal thyroidectomy—lymphocytic infiltration without hyperplasia.
Chapman and Maloof ¹¹	2		No data			

94 mm. diastolic. The thyroid gland was symmetrically enlarged, rather firm, and weighed about 25 gm. Moderate weakness of the quadriceps muscles was demonstrable. The results of examination were otherwise normal.

Pertinent laboratory studies revealed initial values per 100 cc. of serum as follows: 11 mg. of calcium, 2.7 mg. of inorganic phosphorus, 10 King-Armstrong units of alkaline phosphatase, and 6.6 gm. of proteins with 4.0 gm. of albumin and 2.6 gm. of globulin. The value for blood urea was 28 mg. per 100 cc. Repeated determinations of serum calcium gave values of 10.2 and 10.8 mg. per 100 cc. with corresponding values for inorganic phosphorus of 2.9 and 3.2 mg. Roentgenograms of the thorax, kidneys, ureters and bladder did not show evidence of any abnormality. The basal metabolic rate was +18 per cent and protein-bound iodine measured 10.2 micrograms per 100 cc. of serum. A radioiodine tracer revealed 41 per cent uptake in the thyroid in six hours and 53 per cent in twenty-four hours, with a thyroïdal clearance of 42 cc. per minute. Specimens of urine collected over a twenty-four-hour period, with the patient eating a diet containing 135 mg. of calcium, revealed 258, 267 and 319 mg. of calcium on three consecutive days. A calcium-loading test revealed a decrease of 79 per cent in the excretion of phosphorus following the intravenous infusion of calcium.

The patient requested treatment with radioiodine due to a profound fear of surgical procedures. The normal results of the calcium-loading test were considered evidence against coexisting primary hyperparathyroidism. The patient received a therapeutic dose of 7.1 millicuries of I¹³¹ on February 9, 1956. A repeat radioiodine tracer in March, 1956, revealed practically no uptake by the thyroid gland, although the patient was still moderately toxic. The basal metabolic rate was now +29 per cent and the values for serum calcium and inorganic phosphorus were 10.7 mg. and 2.1 mg. per 100 cc. respectively. On April 18, he stated that he felt improved, and clinically he appeared less toxic. The basal metabolic rate was +13 per cent and the value for butanol extractable iodine was 8.9 micrograms per 100 cc. of serum. The value for calcium was 10.9 mg. per 100 cc. of serum and that for inorganic phosphorus was 2.9 mg.

The patient returned to the clinic in July, 1956, be-

cause of symptoms suggestive of early myxedema. On physical examination the clinical features of myxedema were present; the basal metabolic rate had fallen to -26 per cent, and the value for protein-bound iodine had decreased to 2.4 micrograms per 100 cc. of serum. The value for serum calcium was 10.3 mg. per 100 cc. and for inorganic phosphorus, 3.3 mg. His clinical response to 1½ grains of desiccated thyroid daily was excellent. In February, 1957, the basal metabolic rate was -9 per cent; calcium measured 10.2 mg. and inorganic phosphorus 3.0 mg. per 100 cc. of serum. Measurement of urinary excretion of calcium, with the patient eating a diet containing 135 mg. of calcium daily, revealed 168, 140 and 102 mg. of calcium in three specimens collected during consecutive twenty-four-hour periods. The slightly abnormal values for calcium excreted in the urine were not considered to be of diagnostic significance, especially in the presence of normal values for serum calcium.

Case 2.—A thirty-six-year-old white man came to the clinic in November, 1954, complaining of loss of appetite and recurrent episodes of nausea of several months' duration. In 1942, he had passed two renal calculi after treatment with sulfonamide drugs for an infection of the urinary tract. Another renal stone had been passed in 1943. Excretory urograms were reported normal at that time.

Physical examination revealed an obese man, whose blood pressure was 140 mm. of mercury systolic and 85 mm. diastolic. The sclerae were not icteric. Enlargement of the liver or spleen was not noted. The results of laboratory studies were normal, except for values for serum calcium of 10.8 and 10.5 mg. per 100 cc. The corresponding values for inorganic phosphorus were 4.4 and 4.2 mg. per 100 cc. of serum; the value for total proteins was 6.4 gm. per 100 cc. of serum with 3.9 gm. of albumin and 2.5 gm. of globulin. He was unable to stay for further studies of calcium metabolism and was dismissed on a 1500-calorie reduction diet. He returned in January, 1955, because of persistent nausea and recent polydipsia. He appeared stimulated and the radial pulse rate measured 106. The skin was warm, moist and velvety in texture. The thyroid gland was palpable and felt somewhat firmer than normal. The basal metabolic rate was +43 per cent. A radioiodine tracer revealed an *in vivo* uptake

within twenty-four hours of 44.8 per cent by the thyroid with a thyroidal clearance of 36 mm. per minute. The blood sugar measured 130 mg. per 100 cc.; the value for calcium was 11.2 mg. per 100 cc. of serum and that of inorganic phosphorus, 3.8 mg.

After preparation with Lugol's solution, surgical exploration was carried out on January 27, 1955. Right lobectomy with removal of the isthmus was performed because a papillary and follicular adenocarcinoma, grade 1, was found just beneath the capsule at the junction of the anterior and lateral borders of the right lobe. Subtotal left lobectomy also was performed. Histologically, the nonmalignant resected thyroid tissue was found to be hyperplastic. The two parathyroid glands on the right were completely devascularized during the course of the dissection. The right inferior gland was implanted into the right sternocleidomastoid muscle. The left inferior parathyroid was easily located, but the left superior gland could not be identified. Two days after operation the value for calcium was 9.9 mg. and that for phosphorus 3.6 mg., both per 100 cc. of serum. Prior to the patient's dismissal, calcium measured 9.6 mg. and inorganic phosphorus 4.4 mg. per 100 cc. of serum.

In March, 1955, symptoms associated with hypothyroidism developed. The basal metabolic rate was now -17 per cent. The patient was placed on a regimen of one grain of desiccated thyroid daily and ten drops of Lugol's solution three times a day. He returned in June of the same year and appeared to be clinically euthyroid, although he had gained twenty-one pounds. Minimal periorbital edema and bulbar chemosis were present bilaterally, but there was no lid retraction or lag.

In January, 1956, he returned because of progressive signs and symptoms of hyperophthalmopathic Grave's disease. The basal metabolic rate was -18 per cent and the value for serum calcium was 9.3 mg. per 100 cc. The dosage of desiccated thyroid was increased to two grains per day along with 10 drops of Lugol's solution three times a day. The ocular condition has remained essentially unchanged since this treatment was instituted.

Case 3.—A fifty-five-year-old man registered at the clinic in June, 1951, with a primary complaint of loss of weight, generalized weakness, marked irritability and heat intolerance of several months' duration. In April of the same year he was found to have mild diabetes mellitus. His history and the family history were non-contributory.

Physical examination revealed a well-developed man who showed evidence of recent loss of weight. A definite tremor of the outstretched fingers, warm, moist skin, and a radial pulse rate of 92 were noted. Blood pressure was 144 mm. of mercury systolic and 86 mm. diastolic. The thyroid gland was not enlarged but felt firmer than normal. The results of examination were otherwise normal.

The results of pertinent laboratory studies revealed 11.2 and 11.1 mg. of calcium and 4.0 mg. of inorganic phosphorus per 100 cc. of serum; fasting blood sugar measured 179 mg. per 100 cc. The basal metabolic rate was +32 per cent, and the value for protein-

bound iodine was 13.4 micrograms per 100 cc. of serum. A radioiodine tracer revealed 70 per cent uptake in the thyroid gland in twenty-four hours. The specific gravity of the urine was 1.011 and results of the Sulzowitch test were strongly positive. Roentgenograms of the thorax and skull and an excretory urogram did not show evidence of any abnormality.

The cause of the hypercalcemia was not clear. It was recognized that elevated concentration of calcium in the serum could be associated with untreated hyperthyroidism, but the diagnosis of coexisting primary hyperparathyroidism deserved consideration. It was decided to defer further studies of metabolism of calcium until the hyperthyroidism was controlled; a therapeutic dose of 6 millicuries of radioiodine was administered with this intention.

The patient returned in three months at which time he was found to be improved. The diabetes was under good control. He had gained ten pounds and showed fewer clinical signs of hyperthyroidism than on the previous visit. The basal metabolic rate was +9 per cent; fasting blood sugar measured 168 mg. per 100 cc. and cholesterol, 197 mg. per 100 cc. of plasma. Two values for calcium were 11 and 10.5 mg. per 100 cc. of serum with corresponding values for inorganic phosphorus of 3.0 and 3.1 mg. The value for serum alkaline phosphatase was 6.3 Bodansky units. Quantitative studies of the urinary excretion of calcium revealed 149, 138 and 174 mg. of calcium in specimens excreted during three consecutive twenty-four-hour periods, with the patient eating a diet containing 135 mg. of calcium per day. Again, surgical exploration of the neck for a parathyroid tumor was deferred.

In December, 1951, the home physician prescribed $\frac{3}{4}$ grain of desiccated thyroid daily because the patient's basal metabolic rate had dropped to -22 per cent. The patient returned to the clinic the following month at which time he appeared euthyroid. The basal metabolic rate was now -5 per cent. The values for serum calcium on two occasions were 9.8 and 9.6 mg. per 100 cc., with a corresponding value for inorganic phosphorus of 3.6 mg. The value for serum alkaline phosphatase had dropped to 4.4 Bodansky units. The patient was advised to continue taking $\frac{3}{4}$ grain of desiccated thyroid per day and was dismissed. He stopped taking the drug several months later, however, without subsequent development of any symptoms of hypothyroidism. During a routine check-up in 1955 he was found to be in good health. The diabetes was under good control. The basal metabolic rate was -7 per cent and the value for serum calcium was 9.6 mg.

Case 4.—A thirty-three-year-old woman was referred to the clinic on March 8, 1956, with a diagnosis of "toxic goiter." Her illness had started in December, 1955, when she noted generalized weakness, which was most pronounced in her legs, and a tremor of the hands. She subsequently became aware of intolerance to heat and felt "nervous." Enlargement of her neck was a recent development, but ocular symptoms had not become apparent. There was no history of renal calculi, polyuria or polydipsia.

Physical examination revealed a stimulated, restless woman whose skin was warm and moist. The blood pressure was 168 mm. of mercury systolic and 88 mm. diastolic. The radial pulse rate was 136 beats per minute. A fine tremor of the hands was obvious. Ocular examination revealed bilateral proptosis with stare and lid lag. Neither chemosis nor muscle palsy was evident. The thyroid gland was diffusely and symmetrically enlarged and weighed an estimated 30 gm. A bruit was audible over both lobes.

Laboratory studies revealed the following significant findings: 10.8 mg. of calcium, 2.8 mg. of inorganic phosphorus, 4.1 gm. of albumin and 1.9 gm. of globulin, all per 100 cc. of serum. The basal metabolic rate was +44. A roentgenogram of the thorax did not show evidence of any abnormality. Subtotal thyroidectomy was advised and the patient was given Lugol's solution in preparation for operation. On the day before operation, she was much less stimulated and the basal metabolic rate was +24. The value for serum calcium was 10.4 mg. and that for inorganic phosphorus was 2.5 mg. Subtotal thyroidectomy was performed on March 30, 1956, with the removal of 22 gm. of thyroid tissue which histologically showed diffuse parenchymal hypertrophy. All four parathyroid glands were identified grossly and appeared normal. Her recovery from the operation was uneventful. On June 2, 1956, the patient returned to the clinic. Clinical evidence of mild myxedema was present. The basal metabolic rate was -19 per cent; calcium measured 9.9 mg. and inorganic phosphorus measured 2.6 mg., each per 100 cc. of serum. Desiccated thyroid was prescribed because of the myxedema.

Case 5.—A sixty-year-old white woman came to the clinic in June, 1955, having a three months' history of exertional dyspnea and fatigue and recent episodes of tachycardia lasting up to thirty minutes. She had taken Lugol's solution for five days in April, 1955, without subjective improvement. Ocular symptoms had not been noted. Mild polydipsia and polyuria had developed in recent weeks. The history revealed that in 1948 transitory hemiparesis and dysarthria of four to five hours' duration had developed. Symptoms of duodenal ulcer had appeared in 1953, but discomfort from this source had abated after the use of a liberal ulcer diet and Gelusil. Her intake of milk was not excessive; absorbable alkalis were rarely used and she denied any intake of vitamin D.

Physical examination revealed a moderately stimulated woman weighing 150 pounds. Her blood pressure was 134 mm. of mercury systolic and 82 mm. diastolic; the radial pulse rate was 112 beats per minute. The thyroid gland was palpable, but not significantly enlarged. A nodule 1 cm. in diameter was palpable in the region of the left lobe of the thyroid. Complete neurologic evaluation failed to reveal any residuum from a previous "stroke."

Laboratory studies revealed the following pertinent data: 30 mg. of urea per 100 cc. of blood; 180 mg. of cholesterol per 100 cc. of plasma; 11.1 mg. of calcium, 3 mg. of inorganic phosphorus, 15.9 King-Armstrong units of alkaline phosphatase, 3.7 gm. of albu-

min and 2.0 gm. of globulin, all per 100 cc. of serum. Repeated evaluations for calcium and inorganic phosphorus showed values of 11.4 and 3.0 mg. respectively. Roentgenograms of the head and thorax did not show evidence of any abnormality, but roentgenograms of the upper portion of the gastrointestinal tract revealed evidence of a duodenal ulcer. The initial basal metabolic rate was +4 per cent, but the protein-bound iodine was 12.6 micrograms per 100 cc. of serum. A radioiodine tracer revealed 35 per cent uptake in the thyroid in six hours and 53 per cent uptake in twenty-four hours, with a thyroid clearance rate of 34 cc. per minute. Quantitative studies of urinary excretion of calcium with the patient on a diet containing 135 mg. of calcium daily revealed 335, 446, and 495 mg. in three specimens collected during consecutive twenty-four-hour periods.

Despite the minimal clinical evidence for hyperthyroidism the laboratory findings of elevation of the protein-bound iodine and increased avidity of the thyroid for iodine were considered significant. In view of the palpable nodule in the neck and the unlikely possibility that the patient's mild hyperthyroidism could be responsible for the hypercalciuria and hypercalcemia, surgical exploration of the neck was advised. On June 30, 1955, the surgeon identified and removed a typical parathyroid adenoma located in the usual position of the left superior gland. The nodule weighed 210 mg. and was a mixed cell type histologically. The other three parathyroid glands were identified grossly and appeared normal. Subtotal thyroidectomy with removal of 13 gm. of hyperplastic thyroid tissue was performed. Her postoperative course was uneventful. On the first day after operation the value for calcium was 9.0 mg. and that for inorganic phosphorus was 3.1 mg. per 100 cc. of serum. The basal metabolic rate was -10 per cent and the values for calcium and inorganic phosphorus were 9.7 and 3.6 mg., respectively, two weeks after operation.

Comment

The results of laboratory studies of thyroid function in the five cases reported herein (Table II) corroborated the clinical impression of hyperthyroidism. In Cases 1 and 2, the values for serum calcium and inorganic phosphorus were checked because of the patients' history of renal colic or passage of renal stones or both; in Case 5 the value for serum calcium was determined because of unexplained polyuria. In the other two patients, the values for these elements were obtained only because of academic interest. All five patients had hypercalcemia on the basis of values in our laboratory (normal values, 9.2 to 10.4 mg. of calcium per 100 cc. of serum). The alkaline phosphatase was elevated in two of the three patients so studied. Quantitative studies of urinary excretion of calcium in three patients revealed hypercalciuria in each patient.

TABLE II. SIGNIFICANT LABORATORY FINDINGS IN FOUR CASES OF HYPERTHYROIDISM WITH HYPERCALCEMIA AND ONE CASE OF COEXISTING HYPERTHYROIDISM AND HYPERPARATHYROIDISM

Case	Sex and Age	Basal Metabolic Rate, Per Cent	I^{131} , Per Per Cent of Uptake in Vivo in 24 Hr.	Blood Values								Urinary Excretion of Calcium, mg. in 24 Hours		
				Calcium,* Milligrams		Phosphorus, Milligrams†		Urea, Milligrams Per 100 cc. of Blood	Protein-Bound Iodine, Micrograms†	Alkaline Phosphatase, Units†	Proteins, Grams†		Before Treatment	After Treatment
				Before Treatment	After Treatment	Before Treatment	After Treatment				Albumin	Globulin		
1	M 37	+18	53	11.0 10.2 10.8	 10.3 10.2	2.7 2.9 3.2	 3.3 3.0	28	10.2	10 King-Armstrong units	4.0	2.6	258 267 319	168 140 102 (12 mo. later)
2	M 36	+43	44.8	10.8 10.5 11.2	 9.9	4.4 4.2 3.8	 3.6	—	—	—	3.9	2.5	—	—
3	M 55	+32	70	11.2 11.1	 9.6	4.0 4.0	 3.6	24	13.4	6.3 Bodansky units	—	—	—	149 138 174 (3 mo. later)
4	F 33	+44	—	10.8	 9.9	2.8	 2.6	—	—	—	4.1	1.9	—	—
5‡	F 60	+ 4	53	11.1 11.4	 9.7	3.0 3.0 3.6	 	30	12.6	15.9 King-Armstrong units	3.7	2.0	335 446 495	—

*Normal range for serum calcium in our laboratory 9.2 to 10.4 mg. per 100 cc. of serum.

†Per 100 cc. serum.

‡Coexisting hyperthyroidism and hyperparathyroidism.

As mentioned at the outset, the diagnoses of both hyperthyroidism and primary hyperparathyroidism received clinical consideration in each case; however, the fact that in the first four patients the values for serum calcium returned to normal concentrations after correction of the hyperthyroidism, and that in Case 1 the calcium loading test gave normal results indicated that hypercalcemia was secondary to hyperthyroidism. Exploration for a parathyroid tumor was advised in the fifth patient because of the palpable nodule in the neck and the rather unlikely possibility that hypercalcemia and hypercalciuria could be attributed to mild hyperthyroidism. In Case 2, the effect on calcium metabolism of the unavoidable devascularization of the two parathyroid glands is difficult to evaluate. Tetany did not develop during the postoperative period. Values for serum calcium remained normal, which would seem unlikely if a parathyroid tumor was present in the unidentified gland.

The mechanism responsible for the disturbance of calcium metabolism which may occur in hyperthyroidism remains unsolved. In 1929, Aub and co-workers¹⁹ demonstrated that urinary and fecal excretions of calcium and phosphorus frequently are increased in hyperthyroidism. These studies suggested a catabolic action of thyroxine on bone with mobilization of the bone salts. In an effort

to explain the hypercalciuria, Robertson²⁰ theorized a direct action of thyroxine on the kidney with reduction in the renal threshold for calcium, while Hansman and Fraser²¹ expressed the opinion that coexisting hyperparathyroidism is the direct cause of excessive mobilization and excretion of calcium and phosphorus. After recent studies on rats, Engfeldt and Hjertquist²² concluded that thyroxine affects primarily the metabolism of phosphorus by producing an increased concentration of phosphorus in the blood which stimulates the parathyroids to a compensatory increase in function.

All concepts proposed by Robertson,²⁰ Hansman and Fraser,²¹ and Engfeldt and Hjertquist²² involved either primary or secondary hyperfunction of the parathyroid glands, in explanation of the observed alterations in calcium metabolism. These theories may be challenged and considerable clinical and laboratory evidence marshalled to support the contention that no disturbance in the function of the parathyroid glands is present. Aub and co-workers²³ have shown that thyroxine will increase the concentration of calcium in the serum and urine of patients with idiopathic and surgical hypoparathyroidism. Cope and Donaldson²⁴ have reported a case of hypoparathyroidism that developed after subtotal thyroidectomy, in which symptoms of tetany were relieved and the con-

centration of calcium increased in the serum with recurrence of hyperthyroidism.

In cases of primary hyperparathyroidism uncomplicated by renal insufficiency, hypercalcemia and hypophosphatemia are the usual salient findings; but in hyperthyroidism, concentrations of serum calcium and phosphorus are usually normal although, as demonstrated, hypercalcemia may occur. In hyperthyroidism the concentration of calcium in the feces may be high in contrast to the usual normal or low concentrations in hyperparathyroidism. Further contradictory evidence is reported by Askanazy and Rutishauser,²⁵ who found normal parathyroid glands in seven patients having hyperthyroidism with bone disease.

As noted, excessive destruction of bone may be a prominent clinical finding in hyperthyroidism. The bones usually involved are the ribs, pelvis and spinal column. Spontaneous compression fractures of the vertebra have been reported.²⁶ Follis²⁷ found varying degrees of "osteitis fibrosa" in each of twenty patients studied. The disease was manifested by excessive destruction of bone with osteoclastic resorption, by increased vascularity and by proliferation of connective tissue. Osteoporosis, as evidenced by a decrease in the number and size of trabeculae, was present in four cases, with minimal spotty changes compatible with osteomalacia noted in six cases.

In a recent study designed to define altered calcium metabolism associated with thyroid disease with the use of calcium and isotopic dilution techniques, Krane and associates²⁸ found that formation as well as destruction of bone was proceeding at increased rates in the four patients with hyperthyroidism whom they studied. Elevation of the concentration of alkaline phosphatase in some patients with hyperthyroidism without evidence of hepatic disease lends support to these findings. Of interest are findings by the same workers of a similar increase in skeletal turnover of calcium in two patients with Paget's disease of bone. These findings suggested that the turnover of calcium in bones might be related to blood flow, with an increase in the circulation of the skeleton being common to both hyperthyroidism and Paget's disease.

Since little is known about the mechanism responsible for abnormalities of metabolism of calcium in patients with hyperthyroidism without hypercalcemia, it is not surprising that the cause of hypercalcemia in patients with hyperthyroid-

ism remains unsolved. Excessive destruction of the collagenous ground substance of bone with release of large quantities of calcium salts would appear to be a possible explanation. Under these circumstances, the renal capacity for excretion of calcium probably is exceeded. The frequency of occurrence of hypercalcemia in cases of untreated hyperthyroidism has never been accurately determined. In 1945, Puppel and co-workers²⁹ stated that in hyperthyroidism the blood calcium is rarely slightly increased above, and almost never decreased below, the range of normal; yet, as noted, significant hypercalcemia may occur. Despite excessive hypercalciuria which may occur, it is noteworthy that the literature lacks reference to the occurrence of renal calculi in patients with hyperthyroidism.

Summary

Hypercalcemia is one of the manifestations of disturbed calcium metabolism in some patients with hyperthyroidism. The manner in which hyperthyroidism results in hypercalcemia has not been clearly defined. Four cases of hyperthyroidism associated with hypercalcemia and one case of coexisting hyperthyroidism and hyperparathyroidism are presented.

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PROBLEMS IN THE EVALUATION OF MITRAL VALVOTOMY

(Continued from Page 748)

be the prior occurrence of systemic emboli. The use of prophylactic penicillin preoperatively and postoperatively may reduce the incidence of acute rheumatic fever postoperatively, and thereby the incidence of recurrent mitral stenosis. Better selection of patients for surgery may result in an improvement in the operative results. Further careful study of patients operated early in our experience with this disease will be necessary in order that the long term value of this operation may be determined.

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Treatment of Acute Renal Insufficiency

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THE clinical importance of acute renal failure has been more apparent since World War II. The dramatic occurrence of the crush syndrome in England and elsewhere focused attention on the clinical and pathologic aspects of this group of related conditions. There are some excellent monographs on the subject.¹⁻³

Several important therapeutic measures, namely, improved conservative management and the artificial kidney have greatly changed the outlook of anuric patients. Anuria occurs often enough in a general civilian hospital practice to make a discussion of general principles and specific details worth while.

Acute renal failure has been defined by Swan and Merrill¹ as the "clinical syndrome resulting when renal excretory function is rapidly, but temporarily, lost because of alterations in renal circulation and the development of disseminated areas of renal tubular degeneration."

The more common causes are as follows: hemolytic transfusion accidents, crush injury and other severe trauma, prolonged shock, burns, prolonged dehydration, acute liver failure, peritonitis, and poisoning by chemicals such as mercuric, uranium and chromium salts, tartrate, ethylene glycol, carbon tetrachloride, oxalic acid and sulfonamides. Acute glomerulonephritis, acute pyelonephritis, acute bilateral ureteral obstruction, bilateral occlusion of the renal arteries and acute bilateral cortical necrosis of the postpartum period produce acute renal failure with severe oliguria and are difficult to distinguish from the acute renal tubular damage.

The pathology of acute renal failure is complex and varies with the etiology.¹⁻³ It will not be discussed in detail. The reversible nature of the pathology and the great potential of the damaged tubules to heal are worthy of emphasis and are the crux of management. Healing will occur if the

patient can be kept alive for a sufficiently long time.

The pathogenesis of acute renal failure is not clearly established. Some of the probable mechanisms of anuria follow: (1) obstruction of renal tubules with coagulated protein; (2) non-selective reabsorption of all the glomerular filtrate by damaged tubules; (3) leakage of glomerular filtrate through damaged tubules, (4) interstitial edema causing increased pressure, and finally (5) renal ischemia. There probably are elements of more than one of these mechanisms active in many instances.³

There is a protracted and very pronounced disturbance of glomerular and tubular function.^{1,3} The urine to plasma ratio (u/p) for urea is quite low ranging from 1.3 to 2.6.³ Urine specific gravity is in the range of 1.008 to 1.010. Proteinuria is mild to moderate. The urine is usually acid in reaction.

The renal blood flow and oxygen consumption of four subjects with acute renal failure using radioactive Krypton 85⁴ were studied. These measurements were reduced to 20 to 25 per cent of normal.

The general clinical manifestations common to most of these patients will be reviewed. The recognition of anuria or oliguria is not difficult; nevertheless, anuria is often overlooked. Oliguria rather than complete anuria is usual. A urine flow of 25 to 400 ml. of urine is the usual range. An occasional patient with acute renal failure may excrete from 500 to 1000 ml. per day; a progressive uremia and serious hyperpotassemia (especially postoperatively) can occur under these circumstances. Complete anuria should cause one to suspect acute glomerulonephritis, bilateral ureteral obstruction, or bilateral complete renal infarction.

The blood pressure is moderately elevated in most patients. Anemia is often present after a few days of oliguria and uremia.¹ The anemia is well tolerated and doesn't require treatment. Blood transfusions are indicated if massive bleeding has occurred.

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TABLE I. CAUSES OF ACUTE RENAL INSUFFICIENCY

	Total	Died
Carbon tetrachloride	11	2
Ethylene glycol	2	1*
Sulfonamide (?)	1	
Shock, myocardial infarct	1	
Gastro-enteritis and shock	1	1
Perforated ulcer, peritonitis	1	1*
Post-operative:		
**Hypotension during surgery	2	2
**Hypotension following surgery	4	4
Transfusion reaction	1	1
Crush injury, amputation	1	
Bacteremia following cystoscopy	1	
Pheochromocytoma		
(no period of shock, cause?)	1	
	27	12

**In vitro* dialysis by artificial kidney.

**All these patients had serious primary diseases.

either surgical or nonsurgical. Of this group only three patients survived. Two of the deaths occurred in patients with generalized peritonitis, and could be ascribed primarily to that cause, although one had a potassium of 7.7 and the other 8.4 mEq/l. One patient died of acute pulmonary edema due to excessive fluid administration. One patient with anuria due to a hemolytic transfusion reaction during surgery expired with a rapidly rising BUN, a potassium of 7.9 mEq/l, and a severe tracheobronchitis. The immediate cause of one death was hyperkalemia, and the other three deaths in this group were due to the effects of the

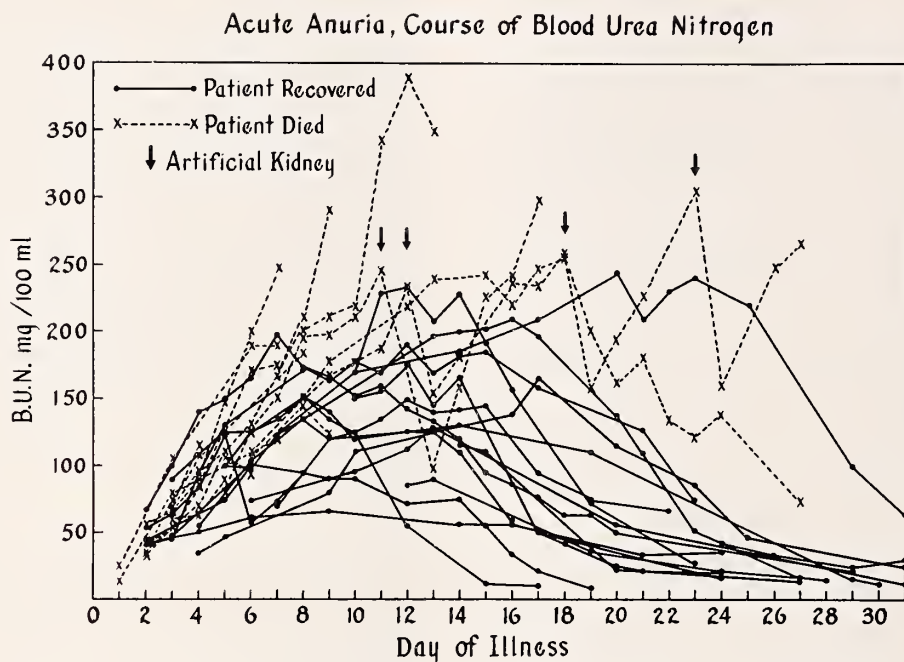


Fig. 1. A plot of the course of blood urea nitrogen determinations illustrates the general course of illness of the entire group.

The mortality rate depends on the type of patient presented. Thirty-nine of the eighty-five patients treated by Swan and Merrill¹ died. Seventeen of thirty-two patients treated by Brun³ died, but only six died of uremia. Twenty-seven of fifty-three patients died as a result of battle injuries and acute renal failure in the Korean War.⁵ Schreiner and Berman⁶ reported that five of sixteen patients with acute portpartum renal insufficiency died.

A series of patients with acute renal insufficiency from 1951 to 1956 were studied at the Minneapolis Veterans Hospital. Fifteen of twenty-seven patients survived. The etiology of the acute renal insufficiency is recorded in Table I.

It can be seen that of the twenty-seven cases, ten were associated with some type of trauma,

uremia. Five of the seventeen nontraumatic cases expired. Of these, one died of acute pulmonary edema and the other four of progressive uremia.

These observations serve to emphasize the often disastrous consequences of renal shutdown in the face of trauma or surgery.

The features of the course of these patients are summarized in Table II.

Figure 1 represents the course of blood urea nitrogen (B.U.N.) in all instances. The individual cases vary considerably, but a general trend is apparent which is useful in understanding the course of the renal impairment. During the first week the B.U.N. rose sharply at a rate which was similar in most cases, with the exception of a few of the milder ones. During the second week there was a general leveling off within the group that

survived. All but three of the deaths occurred prior to the fourteenth day. Of the three, only one survived the first two weeks without the benefit of *in vitro* dialysis. This patient was improving and the B.U.N. was falling, but he died of massive hemorrhage from the colon on the twenty-seventh day. Beyond the fourteenth day a general decline in B.U.N. was noted as renal function was restored. The one case with a rising B.U.N. until the twentieth day was due to ethylene glycol ingestion, and finally cleared completely.

TABLE II. ACUTE RENAL INSUFFICIENCY

	Patients Recovered (15)	Patients Died (12)
Duration of oliguria	1-23	5-27*
Duration of uremia	15-44	5-27
Day of peak diuresis	11-40	
Largest volume of urine	1850-8600	10-1700
Wt. loss after onset of diuresis (kg.)	1.8-9.9	
Intake in excess of measured output per day	693**	1007
Highest BUN	90-243	85-389
Highest potassium	5.0-7.8	5.3-8.9
Lowest sodium	117-136	110-134
Lowest CO ₂	10-25	9-29

*Three *in vitro* dialyses by artificial kidney in this instance.

**Excluding crush injury but swelling of extremity before amputation demanded increased volume of fluid in this patient.

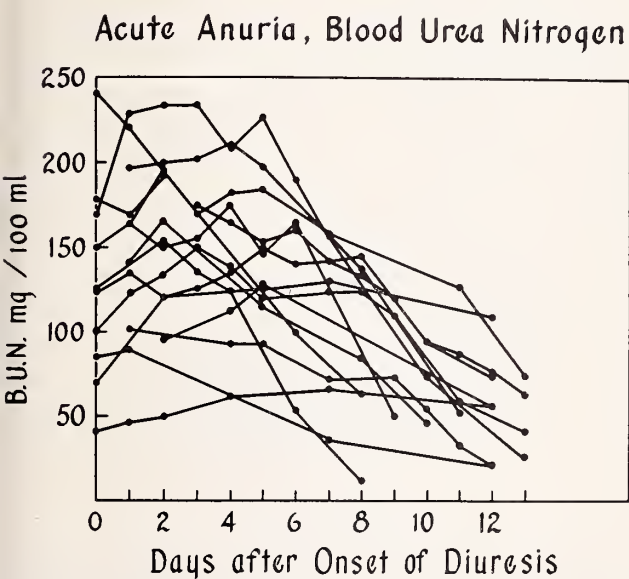


Fig. 2. The course of blood urea nitrogen after onset of diuresis in those who survived illustrates the actual increase or at least plateau of the B.U.N. for some time after onset of diuresis.

The courses of the B.U.N. after onset of diuresis are plotted in Figure 2. The B.U.N. usually continues to rise after diuresis or remains at a plateau for a few days to a week. This fact is important to allay needless worry about the ultimate outcome once diuresis has occurred.

The rapid development of hyperpotassemia in patients with infection or trauma is illustrated in Figure 3. One patient had a sudden occlusion of a femoral artery requiring amputation, and the other had peritonitis. The rapid development of hyperpotassemia after infection and trauma was very well documented by the "kidney team" in the Korean War.⁵

The course of individual patients will be illustrated in the following figures to demonstrate certain clinical and therapeutic problems.

Patient N. S. (Fig. 3), illustrates the need for determining that the ureters are patent. After two

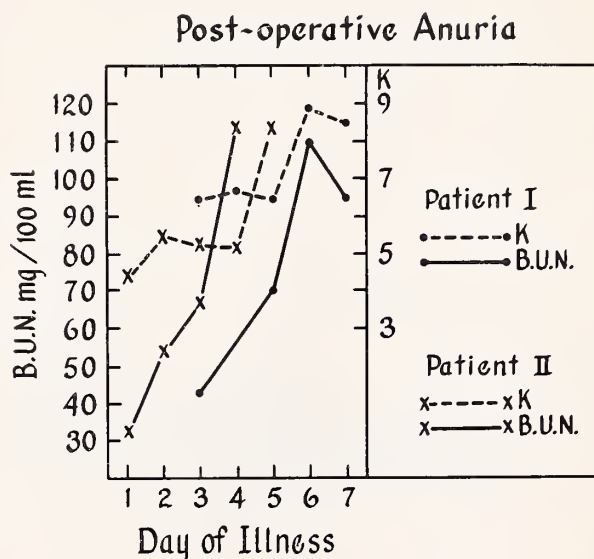


Fig. 3. This figure illustrates the rapid rise of potassium to serious levels in two patients with anuria secondary to gangrene or infection. The potassium is reported in mEq/l.

days of complete anuria cystoscopy was performed. Bilateral ureteral obstruction was encountered. Only the right ureter could be catheterized at this time. Diuresis began immediately. Later the left ureter was also catheterized. The persistence of azotemia for a number of days in spite of diuresis is clearly illustrated.

Patient R. C. (Fig. 5), illustrates the effects of overhydration on serum electrolytes and the subsequent spontaneous recovery. The extent of overhydration is evident from the rapid weight loss following diuresis.

The most important principle of therapy is the limitation of fluids to that amount lost from the body. The amount allowed should not exceed 8 ml/kg. with a top limit of 600 ml. per day in excess of the measurable fluid loss. If fluids are limited adequately, weight loss occurs at the rate of .25 to .5 kg. per day. Even with these pre-

cautions there usually is an accelerated weight loss as soon as diuresis occurs. Bull, Jockes and Lowe⁷ state that they have not seen a patient die before the fourteenth day unless excessive fluids have

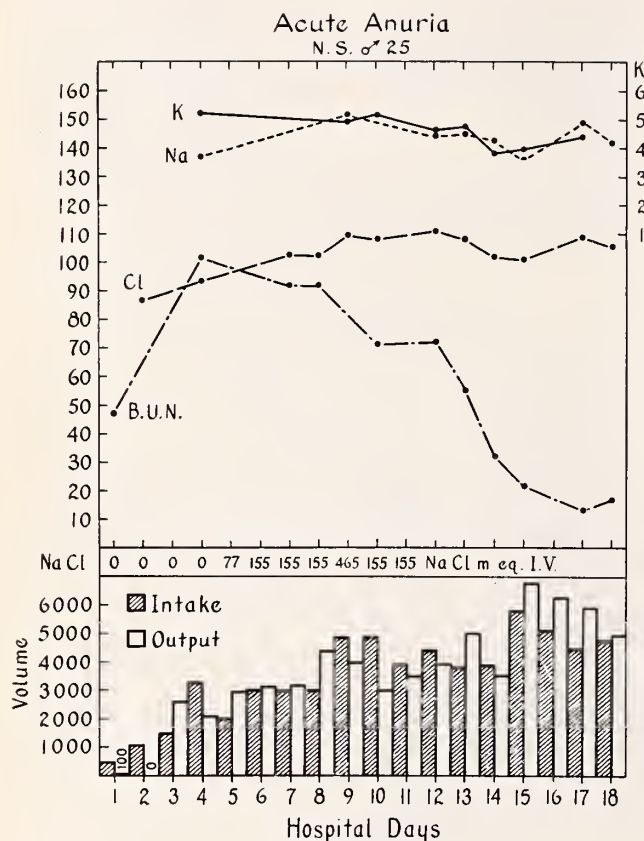


Fig. 4. The importance of determining the patency of the collecting system is well illustrated by this patient's course.

been administered. *The need for a careful daily balance sheet cannot be over-emphasized.*

Unless there is excessive vomiting or diarrhea, it is not necessary or desirable to replace the electrolytes lost in this way. If the volume of loss should exceed 500 ml. in one day or more than 1000 ml. cumulative loss, replacement should be made. It is best to analyze the fluid for electrolyte content and to replace the sodium and chloride but not the potassium lost. Sodium lactate or bicarbonate should be used only for extreme acidosis. It is noteworthy that the range of carbon dioxide was the same for those patients who recovered as those who died.

In order to decrease endogenous protein catabolism and consequent accumulation of potassium and other toxic products, it is important to try to administer as many calories as possible. The rate of rise of urea nitrogen can be decreased to one-half of the pretreatment rise by use of 1400

to 2000 calorie protein-free diet.^{8,9} In order to accomplish this, the feedings should begin at very onset of oliguria. Of course, postoperative patients are handicapped in this regard, but it is possible

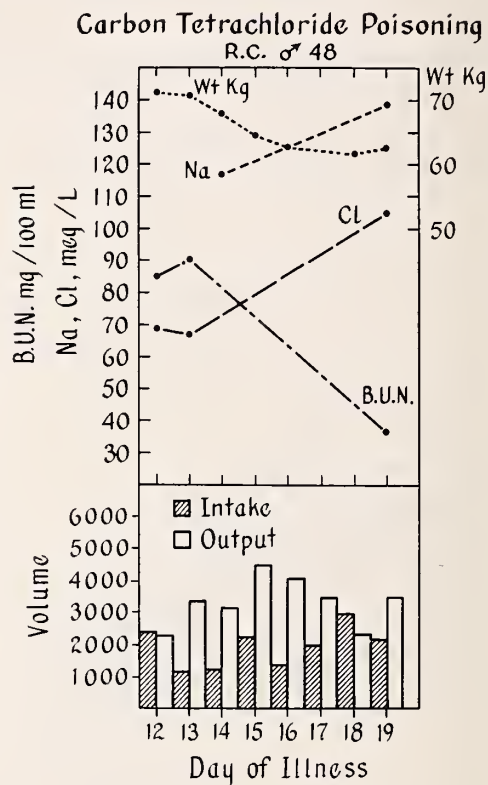


Fig. 5. The results of over-hydration are illustrated in the excessive weight and the hypochloremia. Spontaneous recovery occurred without specific electrolyte therapy.

in those who do not tolerate oral feedings to administer 15 to 20 per cent glucose solution by polyethylene tube intravenously in volumes described above.

The prompt relief of shock and the adequate correction of acute dehydration are essential in the prevention of renal injury.

The use of potassium adsorbing resin has a definite place in the prevention of hyperpotassemia. The use of chlorpromazine to prevent vomiting of the resin mixture as reported by Wilson et al¹⁰ was the key to their success and can be expanded to improve the retention of the high caloric feedings mentioned above.

Phenobarbital should not be used as a sedative or anticonvulsant, since it can accumulate to a dangerous extent. Amobarbital or other short acting sedatives which are not dependent on renal excretion can be used. Streptomycin must be avoided, since it can accumulate to a toxic level and cause damage to the eighth nerve. Surgical

debridement of devitalized tissue or drainage of an abscess are clearly indicated.⁵

Intermittent peritoneal lavage¹¹ has many of the advantages and few of the disadvantages of continuous lavage which proved to be too hazardous for general use. From 3 to 5 liters of fluid containing sodium, bicarbonate (or lactate) and chloride in the concentrations of normal extracellular fluid, plus 5 per cent glucose and penicillin, can be introduced into the peritoneal cavity and removed five hours later. In this time there has been complete equilibration with the extracellular fluids. It is possible to remove as much as 40 mEq of potassium (depending on the serum level, of course). The chief hazard is that the fluid cannot always be removed.

Dialysis with the artificial kidney is reserved for the most seriously ill patients. The utility of the artificial kidney in tiding a patient over the critical period is well established.^{1,3,5,8} The actual mortality rates do not compare favorably with conservative management because of the selection of only most severely ill patients for dialysis. The most convincing example is that of Swan and Merrill.¹ Thirteen of sixteen patients with serum potassiums from 8.1 to 11.5 mEq/l survived.

Conclusions

The recognition and early treatment of acute renal insufficiency results in the recovery of a majority of patients. Success follows the application of the principles of fluid balance and metabolism. The most important principle is restriction of fluids as outlined above. The prog-

nosis of patients with acute renal insufficiency due to trauma, surgery or severe infection is much less favorable than that of patients who have acute renal insufficiency of other etiology.

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CUTANEOUS MANIFESTATIONS OF THE "CARCINOID SYNDROME"

(Continued from Page 772)

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A Practical Approach to the Suppression of Lactation

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IN SPITE of the present-day tendency to return to nature or simplicity of purpose whenever possible, many women either have no desire or find it inconvenient to nurse their babies. This rejection of natural resources without the consent of the body poses a troublesome problem. Many regimens, schedules and medications have evolved in the search for a simple solution.

Today there are three principal methods in use—binders, dehydration, and sex hormones. The practical use of these methods, however, differs with physicians, and there are many different regimens. Each method has its advocates and its critics. Hormone therapy is probably most commonly used.

Object

The series reported upon in this paper was not initiated to determine a definitive approach to suppression of lactation. It is realized that in other hands other methods and regimens may be equally effective. But it is believed that from the standpoint of efficacy, simplicity and practicality, our experience with combined steroids in 1,200 cases deserves reporting.

The paper does not intend to discount the other therapies used to “dry up” the breasts. We no longer give them preference because, in our experience, the complications attending their use sometimes are more tiresome than the benefits received. With combined steroids, however, the excellent results have far outweighed the side effects, which have been negligible.

The method evolved provides comfort to the patient during both the hospital stay and after the patient has returned home. It does not neglect the importance of continued suppression of lactation after discharge. The prevention of recurrent breast engorgement is necessary to insure against discomfort and inconvenience of the patient as well as the attending physician.

Lactation

The physiology of lactation has yet to be satisfactorily and completely explained. Under the

influence of estrogen and progesterone during pregnancy, there is ductular and alveolar proliferation. Thus, the breasts are prepared for secreting milk during the first trimester. However, high estrogen titers inhibit the pituitary's secretion of the lactogenic hormone (prolactin) necessary to actively initiate milk formation. With delivery, this inhibition is removed and the breasts begin to fill.

The mother is usually ready to start nursing late the second postpartum day. However, in the rare patient there is no milk formation. This oversight is difficult to explain, for some patients with apparently no breast tissue have an abundant supply of milk; whereas, a patient with large breasts may not be able to satisfy her baby.

Once nursing is initiated, milk production is continued through a reflex action. Suckling apparently stimulates the secretion of the lactogenic hormone.

Should the patient elect not to nurse her baby, there frequently occurs a painful adjustment during the immediate postpartum period. The release of the lactogenic hormone initiates milk secretion. About seventy-two hours after delivery, the breasts become engorged. Furthermore, headache and general malaise may develop and the breasts become tender and painful. The discomfort frequently necessitates sedatives and strong analgesics for relief.

Rationale

The use of combined steroids is based on the hypothesis that the hormones inhibit the secretion of the lactogenic hormone. It is, in a manner of speaking, a natural approach to the problem.

It has been satisfactorily demonstrated that either estrogen or androgen is capable of suppressing lactation. However, when given alone, side effects may produce conditions more disturbing than painful breasts. Estrogens alone may produce endometrial proliferation resulting in increased lochia and withdrawal bleeding. Androgens may cause virilization.

Combined steroids practically avert these complications; since the two hormones have an additive suppressing effect on the secretion of the lactogenic hormone, it is possible to give smaller doses of each. Furthermore, combined steroids counter-balance the individual influence of each on sex-linked tissue. Finally, combined steroids have a potent anabolic influence desirable after the trauma of delivery. Although the estrogens contribute toward improved electrolyte balance, primarily the beneficial protein anabolic effect is due to the nitrogen retaining power of androgen.

Natural estrogens were chosen because they appear to be tolerated better than synthetic estrogens and because, with them, the incidence of withdrawal bleeding is less frequent.

The medication employed was "Premarin" with Methyltestosterone*, each tablet containing 1.25 mg. of water soluble conjugated estrogens equine and 10 mg. of methyltestosterone.

Regimen

The regimen outlined here is not intended as a hard and fast routine, but as a starting point. Modification may be necessary because of nausea, vomiting, delayed recovery from anesthesia, time of delivery and other practical considerations. In all cases it is important to remember the individuality of each patient and keep the regimen flexible.

As soon as practical after delivery, the patient is given one tablet (1.25 mg. "Premarin"; 10 mg. Methyltestosterone). This dose is repeated three times a day for four days. On the fifth day the dose is reduced to one tablet a day and continued at this level for ten days. Thus, for the average hospital stay of five days, the patient is given 1 tablet three times a day, for the first four days. On the day of discharge and for the first nine days at home, she is given one tablet.

For a patient who starts to nurse her baby but either has no milk or changes her mind, the same regimen is started. She is instructed to start skipping breast feedings and substitute a bottle in the following manner. Skip one feeding the first day; two, the second, et cetera, until the baby is being fed entirely by bottle. "Premarin" with Methyltestosterone is given from the first day as previously described. It should not be forgotten that once lactation has been initiated suppression is more difficult.

By this regimen the reflex secretion of the lactogenic hormone is gradually eliminated while the estrogen and androgen suppress the pituitary secretion of this hormone.

Adjunctive Measures

Should a patient complain of engorgement on the third postpartum day, she is given stilbestrol (5 mg.) stat. (To soften hard breasts, a nursing patient is also given 5 mg. of stilbestrol).

Analgesics are not needed except in the rare case, the failures. Some patients, however, do receive analgesics on the first few postpartum days for other reasons, such as the pain and discomfort of an episiotomy.

All patients wear loose binders, no different from those worn by nursing mothers. Because these binders do not exert any pressure whatsoever on the breast, they cannot be considered to play a role in suppressing lactation. They served no more than as a loose support.

Although restriction of fluids is not a part of the regimen *per se*, the patients do not receive copious amounts. They are told to drink liquids sparingly. No patient receives a diuretic.

Selection of Patients

During a three-year period we delivered in private practice 2,853 patients. It was necessary to suppress lactation in 1,302. Of these, 1,194 were given "Premarin" with Methyltestosterone and are reported in this series. The remaining ninety-three are not included because they either received nothing or were given other medications.

The number who did not receive combined steroids was insufficient to use as a control. Furthermore, in view of the good results it was not deemed advisable in private practice to deny patients the benefit of this therapy for the sake of a control series, especially when the excellent results are substantiated in a series of almost 1,200 cases.

Results

The results were graded in relation to the achievement of the aim of therapy—successful suppression of lactation with the least discomfort and inconvenience. The following three categories were used:

Excellent: Lactation successfully suppressed with no discomfort to the patient during the first fourteen postpartum days with no side effects.

*Ayerst Laboratories, 22 East 40th Street, New York City.

TABLE 1. RESULTS ACHIEVED WITH
"PREMARIN" THERAPY

Day Therapy Started	Excellent No. %	Satisfactory No. %	Failures No. %	Total
1st day	690 75.2	196 21.3	32 3.5	918
2nd day	130 74.3	38 21.7	7 4.0	175
3rd day	32 68.1	12 25.5	3 6.4	47
4th day	26 60.5	13 30.2	4 9.3	43
Over 4 days	7 63.6	3 27.3	1 9.1	11
Total	885 74.1	262 22.0	47 3.9	1194

A slight leakage of milk from the breast was not considered undesirable.

Satisfactory: This category includes the patients whose lactation was successfully suppressed but who, on the third or fourth postpartum day, noted slight engorgement and were given 5 mg. of stilbestrol. There were no complications.

Failure: Tender, painful or engorged breasts classified the patient as "failure." If the patient made any complaint at all that her breasts were painful, she was classified as unsatisfactory.

The therapy has been most gratifying. In only 3.9 per cent of the patients was it a failure. Eight hundred and eighty-five (74.1 per cent) were never aware of any physiologic adjustment taking place in their breasts. Two hundred and sixty-two (22.0 per cent) noted a full sensation about the third postpartum day. The sensation was not uncomfortable or painful but did signify activity of the glandular tissue. In final appraisal, the regimen permitted 1,147 or 96.1 per cent of the patients to circumvent the discomfort and inconvenience frequently associated with "drying up" the breasts.

Side Effects

Side effects were absent. There were no cases of postpartum bleeding which could be attributed to the "Premarin" with Methyltestosterone. There were no delayed menses, no excessive lochia or signs of virilization. There was no nausea or vomiting due to the combined steroids.

Observations

Although the comprehensive benefits without side effects are attributable to the administration

of both estrogen and androgen, estrogen alone can play an important role in the suppression of lactation. This is demonstrated by the fact that stilbestrol given in one dose softens the breasts. However, because side effects are more frequent with the female hormone alone, combined steroids are used routinely.

Although we did not evaluate it in more than a few cases, a short course with larger doses of combined steroids showed relatively good results. However, a more protracted regimen of one tablet daily for ten days after the initial course acts as insurance against "rebound" filling of the breasts.

The time of initiation of therapy should be considered. Although we do not feel that it is necessary to initiate therapy immediately after delivery, we have observed that unnecessary delay reduces the possibility of excellent results. Referring to the chart, there is noted a general tendency to fewer "excellent" and more "satisfactory" results and "failures" with increased time after delivery. This tendency is not marked, and as the study was not set up to compare the different times of administration no conclusions can be drawn.

One important practical advantage of this regimen is that it can be administered without fear of undesirable side effects. This is due primarily to the relatively small amounts of the individual hormones administered, plus their balancing action on sex-linked tissue.

Summary and Conclusions

In a series of 1,194 patients combined steroids was used to suppress lactation. The regimen was three tablets three times a day the first four postpartum days and one tablet daily for ten days thereafter. Evaluated in relation to the achievement of the aim of therapy—comfort for both the patient and attending staff—the regimen was successful in 96.1 per cent of the cases. There were no side effects or complications attending the therapy. In our hands, the use of combined steroids ("Premarin" with Methyltestosterone) has practically solved the problem of suppressing lactation.

Counseling with the Hearing-handicapped Child and his Parents

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THE FIRST problem to be faced in counseling children with impaired hearing is that of identifying them as early as possible. Deafness is not so easily detected as blindness or crippling. This is particularly true when the loss of hearing is incomplete, but even total deafness may go unrecognized for a number of years in early childhood.

Although there is no certain means of identifying deaf babies, a number of clues are likely to suggest deafness at an early age. If a baby responds to visual and tactile stimuli but not to sound, the possibility of deficient hearing must be considered. The probability of deafness is high if an otherwise alert child is not awakened or occasionally startled by loud sounds. By the time a normal child is a year old he may be expected to notice the speech of others even if he does not produce words himself. Failure to develop speech at the appropriate age or an unusual quality of voice may indicate failure to hear perfectly.

At a later stage the child who does not come when he is called, and does not follow directions well, may not be disobedient, as probably will be thought; he may be hard of hearing. The child who is restless and inattentive in school or who sits quietly by himself and does not participate in the activities of the classroom may behave this way because he does not hear well. Every child who must repeat a grade in school should be studied carefully to determine whether defective hearing is the cause of his failure. It is hoped that either schools or public health agencies will conduct audiometric tests regularly so that all

children will be checked for acuity of hearing frequently during their elementary school years.

After a child is known or suspected to be deficient in hearing, the important problem is to determine the amount and type of deafness. There are a number of ways to measure the hearing of children. By the use of one or more of the appropriate techniques it is usually possible to make a reasonably accurate evaluation of the degree and type of deafness.

Most children four years old or older can be tested either by routine audiometry or by play audiometry. Frequently three-year-olds and occasionally even younger children will respond to games in which controlled sound is used as a stimulus for overt responses. Speech audiometry may be employed in a number of ways to add information about a child's hearing. Among young children the commonest type of response to speech signals is that of following directions, as by pointing to objects or pictures. Older children may respond as adults usually do, by answering questions or repeating words.

Possibly the most objective means of observing a child's response to sound is the measurement of electrical changes that occur in the skin when sound and associated stimuli are employed. This technique, which is known as "psychogalvanic skin-resistance" audiometry, has been hailed as the best answer to the problems involved in measuring the hearing of very young children. Although it has proved helpful to some examiners, other observers consider that it has left much to be desired. Certainly it has not replaced the need for keen observation and judgment in interpreting the outward behavior of children. Some trained examiners can judge the acuity of hearing with remarkable accuracy by observing reflex and gross reactions to various sounds in a child's environment.

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The results of audiometric tests along with thorough otologic examination and medical history of a child with hearing difficulty should reveal the type of deafness that is present. Fortunately, the vast majority of losses of hearing found in children are of the conductive type of deafness due to obstructions in the transmission of sound. Most of these losses may be expected to respond favorably to medical or surgical care if appropriate treatment is applied before permanent damage occurs.

A small but significant percentage of deafness among children is perceptive in nature. In perceptive or nerve deafness the failure is in the structures of the inner ear or in the auditory nerve proper. Most losses of hearing of this type are not amenable to either medical or surgical treatment.

After a diagnosis of perceptive deafness has been established, it is important that attention be given to compensatory and educational measures designed to alleviate the handicap. One of the first considerations for a child who has permanent loss of hearing is the use of a hearing aid. If the loss is enough to cause difficulty in understanding speech and is not too severe to permit benefit from amplification, a hearing aid probably should be provided. Many children are now wearing hearing aids satisfactorily. Most current instruments are small and convenient to wear, and at the same time provide relatively good amplification of speech. If the degree and type of deafness can be determined with reasonable accuracy, it usually is not difficult to select a suitable hearing aid. Certain basic considerations with regard to the type of instrument and the way it should be worn need the attention of an otologist and an audiologist.

The problems and limitations of hearing aids should be understood by parents and teachers of children who wear them. To some extent these problems are similar for all users of hearing aids, but more important than the similarities are the individual reactions to amplified sound. A hearing aid does not improve the ability to hear; rather it may improve the signal to be heard. This basic fact often is ignored in the desire to solve all problems of hearing by supplying an instrument. It is not unusual to encounter degrees and types of deafness for which a hearing aid is of no significant benefit.

One of the most important and useful skills

for any person with defective hearing is that of reading speech from visual clues. The ability to read speech can be developed into an accomplishment of remarkable proportions. A skillful speech reader learns to take into account the whole situation, including the gross environment as well as the minute details of facial and body movement. This skill is helpful in communication regardless of the degree or type of deafness. Of course, the specific goals and the extent to which speech reading is used will vary with the degree of deafness and with the maturity of the pupil. It is desirable that all children with permanent disability in hearing start learning to read speech as early as possible. As soon as a child can be induced to watch the face of someone talking to him, he is ready to start making associations between the movements and expressions he sees and the articles or situations at hand. Fortunately much of this skill may develop naturally along with the general powers of observation. However, in addition to this natural development, it is beneficial to provide systematic instruction and a high level of motivation. As in all learning, the goals should be placed so that success becomes a motivating force.

In addition to the use of a hearing aid and the practice of speech reading, most children with partial loss of hearing can benefit from training and practice in effective listening. Poor hearing is likely to be accompanied by poor habits of listening. Auditory training for children is designed to develop and utilize the residual hearing as effectively as possible. Whether a hearing aid is used or not, this aspect of training can be employed, and it should be started as soon as the loss of hearing is discovered.

Since the production of speech is normally motivated and controlled by auditory stimulation, any defect in hearing may result in defective speech. This effect may be minimized by training in the use of visual, tactile and kinesthetic senses to help regulate the production of speech. Most children with some degree of hearing can learn to speak satisfactorily. Even the totally deaf may learn to speak intelligibly, although the rhythm and quality of voice are never normal. Again, it is important that proper stimulation and training be instituted as early as possible.

It is apparent that much of the emphasis in

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Pathologic Fractures Due to Metastatic Bone Disease

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THE DEGREE of damage to the structural integrity of the bone by a metastatic cancer depends upon many factors. The osteolytic properties of individual tumors vary considerably, and the behavior of any one tumor can change during the course, either spontaneously or as it is affected by systemic or local treatment. In addition to the effect of the local tumor deposit itself, the adjacent bone may be further weakened by atrophy accompanying disuse and debility, and by the effects of irradiation directed at the metastatic lesion. When the involved bone can no longer support the stress of the patient's activity, pathologic fracture occurs.

Occasionally, such a fracture may be the first sign of metastatic bone disease. In most cases, however, a diagnosis of cancer has already been made and the patient is under treatment or observation. Bone pain is usually present and well localized prior to fracture. It is well, therefore, to emphasize the value of *prophylaxis* in the management of pathologic fractures. Trouble can be anticipated. The discovery of a small osteolytic lesion followed by the institution of treatment by irradiation will frequently lead to the arrest of bone destruction. Systemic treatment with hormones or other chemical agents may accomplish the same result. Predilection to fracture is decreased.

Corsets or braces may be used to protect weakened areas in the vertebral bodies. Crutches can be used to decrease the stress of bearing weight during ambulation. If a real threat of pathologic fracture exists, the patient's activities can be further restricted. If such a lesion is present in a long bone and can be suitably supported with

an intramedullary nail, prophylactic nailing, before fracture occurs, is indicated.

When pathologic fracture occurs, it is commonly associated with only incidental trauma. Indeed, such fractures have been referred to for years as spontaneous fractures. A cough, a turning in bed, a sudden muscular effort, may fracture even the shaft of the femur. The history of the injury producing the fracture is an important diagnostic feature; by its very insignificance it should draw attention to the possibility that the fracture is a pathologic one.

Since the trauma producing fracture is small, the displacement of the fracture fragments is usually slight. Gross deformities are unusual. This is confirmed by the radiographs. The collapse of the weakened area of bone results in a transverse fracture line whose edges may be ragged and poorly defined. The fragments do not look as though they would fit neatly together when reduced. There may be other areas of metastatic bone disease visible above or below the fracture or in adjacent bones. In most cases bone atrophy is also present. The diagnosis of pathologic fracture can be suspected or established by the examination of the initial radiographs in almost every case.

The principles governing the management of pathologic fractures are no different than those in other fractures. Their object is to relieve pain and to restore function as quickly as possible. Time is of the essence in the patient with metastatic bone disease, for his life expectancy is usually short. For this reason those methods permitting early activity of the patient, even in a limited way, are to be preferred to those requiring prolonged immobilization. Open reduction and internal fixation with intramedullary nails or pins is the ideal method for the treatment of pathologic fractures of the shaft of the femur or humerus. A combination nail-plate can often be used for patho-

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logic fractures in the trochanteric region of the femur. The chief prerequisite for successful internal fixation is the presence of bone, on either side of the fracture, sufficiently strong to allow adequate purchase for fixation. If any irradiation is to be given to the site of fracture to control the local tumor growth, it should be given prior to internal fixation, since the presence of large metallic foreign bodies in the field to be irradiated greatly affects the dose actually delivered to the tissue.

Unfortunately, many pathologic fractures are not suitable for internal fixation and more conservative means must be used. Every effort should be directed toward allowing as much activity as possible. The criterion of adequate immobilization is the relief of pain, and this often can be achieved by a dressing which would be manifestly inadequate to manage a normal fracture. Frequently, although the fracture may initially require strict immobilization, after treatment of the metastatic

lesion, the amount of immobilization required can slowly be reduced to a minimum.

If the pain of the fracture cannot be controlled or if the function of the limb is compromised by continued tumor growth, lymphedema, or thrombosis, amputation should be strongly urged as a palliative measure. When this is not possible, chordotomy should be considered.

A surprising number of pathologic fractures will show evidence of healing, especially when the tumor has been actively treated. Some will go on to solid union with restoration of function.

Pathologic fracture is a complication of metastatic bone disease. Whenever possible, fracture should be prevented by active prophylaxis. When fracture occurs, the underlying malignant disease remains the major problem and should not be obscured by preoccupation with the fracture. In all of these situations, continuing efforts should be made to control the growth of the tumor.

COUNSELING WITH THE HEARING-HANDICAPPED CHILD AND HIS PARENTS

(Continued from Page 798)

meeting the needs of children with defective hearing lies in early recognition and training. This places a serious responsibility on the parents of such children, since many of the rehabilitative measures should start before the usual age of attending school. When parents learn that their child of preschool age has a permanent impairment of hearing, they are faced with the alternatives of directing the early training themselves or finding facilities for this type of training. The latter course usually is more desirable, since most parents do not have eminent success in the formal aspects of teaching their own child. It is imperative, however, that parents learn to co-operate with the school and to supplement the work of the specially-trained teacher. When parents do accept the major responsibility of teaching their child, care must be taken that they do not neglect their role as effective parents. The child who gains an energetic teacher but loses a loving par-

ent is not a fortunate child. The most important thing that parents can do for a handicapped child is to give him the affection and security of normal family life. This means that he must learn to share the responsibilities as well as the pleasures of the home. It means that he should receive generous recognition and praise for worthy accomplishments, and appropriate restraints and discipline when they are needed. It requires conscientious effort by a whole family to keep from spoiling a physically handicapped child. If this effort is not successful, the result is that an emotional handicap is added to the physical one.

There is abundant literature designed to help parents of children with impaired hearing, and many schools and clinics offer guidance to parents as well as instruction to children. If all the information and facilities for meeting the problems of impaired hearing are utilized effectively, the results are exceedingly worth while.

Clinical Notes

Basic Laboratory Procedures

CHARLES VANDERSLUIS, M.D.

Bemidji, Minnesota

The most difficult and time-consuming part of our practice is diagnosis. It seems more burdensome because of the need for laboratory work which is sometimes deferred or influences us in sending the patient to a hospital where all of this is done at increased cost to the patient or to an insurance company and at no profit to ourselves, and, sometimes, to our subsequent embarrassment when or if the patient realizes that he really did not get much good out of his hospital stay. There is the additional chance that the hospital laboratory work, because of the volume and routine nature of it, may not be accurate, even in the hands of experienced technicians, and the work needs repetition. The office should be the diagnostic workshop. This is the best place to iron out "bugs" or inconsistencies.

Medicine can be practiced without laboratory aids, but not so well as with them. Strange as it may seem, within the past year two diabetic patients running urinary sugar have come into the office. These were previously undiagnosed although seen a number of times elsewhere for complaints due to their diabetes mellitus. Their doctors were reluctant to do even elementary laboratory work. Just as no general practitioner can do his patients justice without at least a fluoroscope (because pneumonia in children and adults is no longer susceptible of definite detection by physician examination), neither can he do his patients justice without at least a coarse screen of laboratory work.

Feeling that routine laboratory tests are as yielding of useful information as the average physical examination, I have devised a little battery of them which can be run through rapidly on urine and blood samples and can be taught readily to a previously untrained assistant.

As Figure 1 shows, urinalysis bottles are kept in order on the top of the rack over the sink.

Presented at the meeting of the Upper Mississippi Medical Society, Bemidji, Minnesota, June 15, 1957.

These give, in addition to the usual routine, a Sulkowitch and urobilinogen determination.

The albumin reagent, Bunitest, or a 5 per cent solution of sulfosalicylic acid, is added to urine from a TK dropper bottle. Any quantity of albumin is checked by heat and 5 per cent acetic acid because false positives occur occasionally, notably in patients taking Gantrisin. False negatives have not been seen here. Clinitest is still used for sugar, rather than Clinistix or Testape, because the tube can be shaken and set in a rack for observation as fast as the tape can be balanced on the edge of the sink or put in a clip. A small bowl of water with a medicine dropper in it sits within easy working distance.

The Sulkowitch test is run simply by adding about 1 cc. of the reagent from a TK dropper bottle to about 2 cc. of urine. A moderate amount of white precipitate of calcium oxalate is normal. A lesser precipitate is common in urines of low specific gravity and in children, and in adults it raises the question of a low blood protein, which is accompanied by low blood calcium, as well as other possibilities. Small amounts of precipitate sometimes take a minute to appear, so the tube cannot be dumped without being allowed to sit. A heavy milky precipitate will be rarely seen, but when it occurs it raises the suspicion of high blood calcium and enables one to suspect hyperparathyroidism, which is otherwise easy to miss. In pregnancy, a rather heavy precipitate generally forms rapidly, and this must usually be ascribed to the conditions of gestation. This test should be repeated several times on different days before drawing definite conclusions or ordering a blood calcium, which is difficult to perform or obtain in small towns.

Urine urobilinogen is easily checked by adding to a small amount of urine an equal amount of Watson's modification of the Ehrlich reagent, and, to this mixture, an equal amount of saturated solution of sodium acetate solution, both

poured from TK dropper bottles. This test is negative or only faintly pink in a normal urine but gives varying degrees of red, extending to red-dish purple, in urines containing abnormal

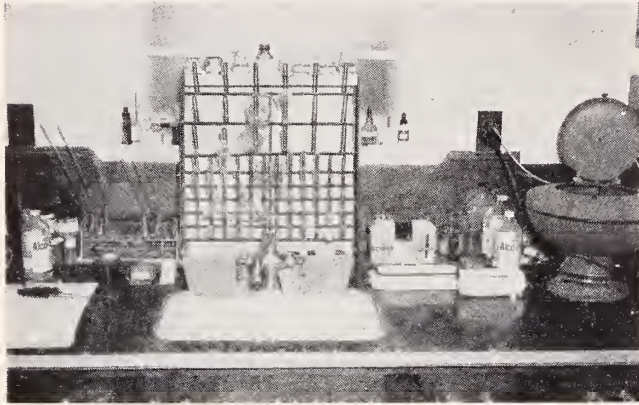


Fig. 1. Urinalysis bottles in position above sink.

amounts of urobilinogen or porphobilinogen. These two latter compounds can be differentiated by adding chloroform, which will take up the red of urobilinogen and be colored, but will remain clear in the presence of porphyrins.[†] All positive Ehrlich tests are repeated after washing out the test tube because oftentimes there is enough contaminant in a tube which has been used for forgotten tests to give a false positive reaction.

Urine urobilinogen has been particularly useful in cases of jaundice. Hepatitis sometimes shows a positive urine urobilinogen early in the disease be-

[†]By the use of this routine Watson-modified Ehrlich test, I recently found a patient who repeatedly ran a 4-plus "urobilinogen." Dr. C. J. Watson, of the University of Minnesota Medical School, set me right by identifying this substance as porphobilinogen and he went on, by spectrographic means, to identify large amounts of uroporphyrin and coproporphyrin and make a diagnosis of acute intermittent porphyria. Unfortunately, some porphyrias can be missed by this routine Watson-modified Ehrlich test if porphobilinogen is absent or small in amount because uroporphyrin and coproporphyrin do not give a positive Ehrlich reaction.

There have been a few inconsistencies in these "urobilinogen" tests, for which I do not know the explanation. After placing an Ehrlich-positive urine in the ice box for a day for conversion to urobilin so that the Schlesinger test (green fluorescence with compound solution of iodine and saturated alcoholic solution of zinc acetate) can be run on it, the Ehrlich test will continue as positive as ever; so it must be considered equally sensitive to urobilin. However, when I formerly ran only the Schlesinger test on urine from patients following coronary occlusion, it seems to me I found a much higher number of positives than since I forsook this test in favor of the simpler Watson-Ehrlich test. I am going back to Schlesinger's test in these cases and run the Ehrlich test on these which are positive to see whether there is a discrepancy, which I suspect is present.

fore jaundice occurs, and at times jaundice fails to appear. In hepatitis with jaundice, the urine urobilinogen is usually strongly positive, paralleling the cephalin flocculation test results, while in



Fig. 2. Small office laboratory.

cases of pure obstructive jaundice the urine urobilinogen is negative or very slightly positive. Urine urobilinogen may be persistently positive in cases of congestive heart failure, but in my experience the variabilities in reaction cannot be linked with the state of compensation. Urine urobilinogen may be temporarily positive in cases of internal hemorrhage or infarct, pneumonia, and untreated pernicious anemia, and often for undetermined reasons, but it is important to recheck immediately positive results on the same specimen, as indicated above.

This Ehrlich test will not show a normal reaction in urines containing sulfa, but will turn the urine yellow. This has the advantage of showing that the patient has been taking sulfa in some form, whereas the urine sediment cannot be relied upon to show crystals. While all this has been going on, the urine is spinning in the centrifuge, and the centrifuge can now be stopped and the sediment examined. Oftentimes the supernatant urine is more clear than the original specimen and gives a better test for albumin and calcium.

Ictotest, manufactured by the Ames Company, is the easiest reagent for use in determining the presence of bile. It is rapid and sensitive and is used on suspected urines. The above urine examination can be done in two or three minutes.

The routine procedure for blood examination requires between ten and fifteen minutes. Four cc. of arm blood are drawn and some is poured from the syringe into a small Cutler sedimenta-

tion tube containing 4 per cent sodium citrate up to the mark, and this tube is quickly and gently shaken. The rest of the blood is poured into a Wassermann-size vial containing the evaporated

poured into the glass cell of a wedge-type hemoglobinometer. Smears from this blood are satisfactory for a differential count, but better smears for cell morphology can be made directly from



Fig. 3. Small office laboratory.

residue of 1/2 cc. of a solution of 2.4 grams of ammonium oxalate and 1.6 grams of potassium oxalate in 200 cc. of distilled water (dried in an incubator).^{*} This vial is immediately and gently shaken to avoid clotting. One cc. of this oxalated blood is immediately drawn back into the same syringe to fill a Wintrobe sedimentation tube, which is gently shaken from end to end and then set in the Wintrobe rack. The timer is set for an hour for both the Cutler and Wintrobe rates.

The rest of the oxalated blood in the vial is used to fill pipettes for the counts, and a little is

^{*}When this article was originally written, I was using 2 drops of 20 per cent potassium oxalate solution in a Wassermann tube as a blood anticoagulant. Because of low hematocrit readings, I returned to the oxalate mixture residue, in spite of the fact that clotting occurred more often, because the hematocrit readings were higher and more consistent with the red count and hemoglobin values. Just why 20 per cent potassium oxalate solution leads to abnormal cell packing, I do not know. Hemolysis was not visible in the tubes. A table is presented with comparative values of sedimentation rates and packed corpuscular volume hematocrit) using different sedimentation tubes and different anticoagulants.

Case	Sedimentation Rate			Hematocrit Per Cent		Icterus Index Units	
	Cutler	Wintrobe Ox. Mixt.	20% K Ox.	Ox. Mixt.	20% K Ox.	Ox. Mixt.	20% K Ox.
1 HD	25	47	44	43	33		
2 SF	7	9 1/2	8 1/2	44	35	10	10
3 EG	9	16	13	45 1/2	37	10	5
4 AP	20	29	28	35	28	10	5
5 LM	15	22	16	37 1/2	29 1/2	15	15
6 PS	11	11	17	47	40	17 1/2	
7 RB	5	6	6	41 1/2	35 1/2	12 1/2	12 1/2

One can see from the above that it is necessary to use similar tubes and similar anticoagulants in order to compare readings of sedimentation rates and packed corpuscular volume.

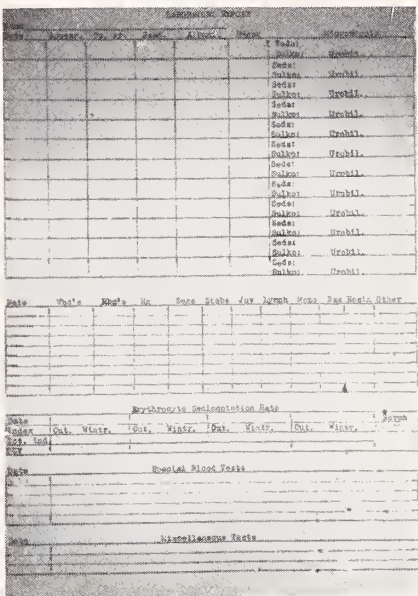


Fig. 4. Mimeographed office laboratory sheet.

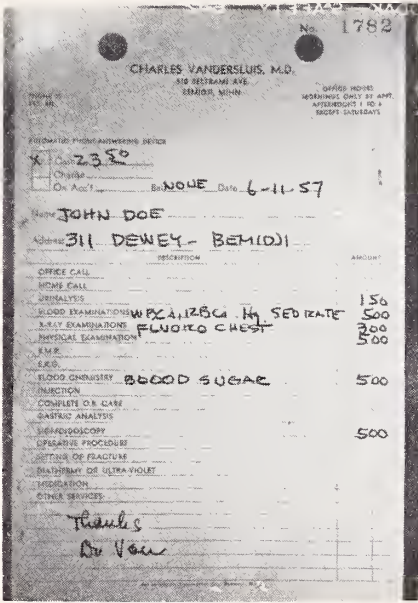


Fig. 5. Sheet from Moore billing machine.

the nonoxalated blood, although taking this from the syringe slows up handling of the blood and may result in clotting of the oxalated blood. Differential blood counts are done only on abnormal blood and are usually taken from the finger tip so that cell morphology can be appreciated. When well done, they are time-consuming.

An American Optical hemoglobinometer cell is filled by discarding a little blood from the vial into the sink in order to wet the edge of the vial and then pouring directly from the vial lip into the cell. It is stirred in the cell with an hemolysis stick and the hemoglobin read in a minute. This method is not subject to the error of the Sahli method in that addition of water or any other reagent is not necessary. The results match those of photoelectric colorimeters.

The advantage of running two sedimentation rates is that one serves as a check on the other. Sedimentation rates are subject to error because of clotting of blood in the tube and other undetermined causes of misbehavior. The Wintrobe reading is about double the Cutler reading when the rate is abnormally high, while the normal values approximate each other within the range of 0 to 8. The Wintrobe method gives one the advantage of an hematocrit reading, in case one is doubtful about the presence of anemia or plethora. The Wintrobe tube can be spun for half an hour in the centrifuge or can be left in the centrifuge and spun during the day with the urines until a few observations show that the red cells do not pack any lower. The supernatant plasma can then be observed for color and, if it looks icteric, it can be compared with icterus index standards in the Wintrobe tube rack. If one is doubtful about the type of anemia one can get a lead by observing the plasma, which is slightly icteric in pernicious anemia and pale in hypochromic anemia. One can get further information by calculating the red cell volume and red cell hemoglobin concentration from the hematocrit reading and red count and hemoglobin values. For the hemoglobin concentration within the red cells, however, one must determine a standard of

normal hemoglobin in his practice and call this 100 per cent because three scales of 100 per cent are in current use—15.6, 14.5 and 13.8 grams per cent. On the American Optical hemoglobinometer, the grams are read directly, and below this figure are the percentages of all the scales named above. In my practice 14.5 grams per cent is the closest to a standard of normal. It is helpful to supply the hospital laboratory with the Cutler and Wintrobe tubes for use with your patients if you adopt this method, so that you can apply hospital findings to the office findings. It is impossible to translate a Westergren sedimentation rate to a Cutler or Wintrobe reading, because of the much greater tube length of the former. It is worthwhile to invest in a Wintrobe icterus index standard rack to determine icterus index. Although carotins and hemolysis can interfere at times, in practice this rarely happens.

The routine cancer detection examination has encouraged more stool examinations for occult blood, and this is confusing, because small traces of blood are found with Hematest, as well as with other reagent combinations. The most one can say is that more definitive examinations, such as proctoscopy, sigmoidoscopy and x-ray examinations have resulted, and these have been valuable in stimulating examination for the notoriously silent gastrointestinal tract malignancies.

Pictures of a good small office laboratory are shown (Figs. 2 and 3), occupying three sides of a small room. A picture of a mimeographed office laboratory sheet, which has stood the test of years, is likewise presented (Fig. 4). The picture of the billing sheet, from a Moore billing machine, is shown for what appeal it might have to those of you who like to let the patient know what work has been done, as well as what the charges are (Fig. 5).

ENDOCRINOPATHIES IN CHILDHOOD

(Continued from Page 781)

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Editorials

JOHN F. BRIGGS, M.D.
ARTHUR H. WELLS, M.D.
HENRY G. MOEHRING, M.D.

KEEPING OUR PHYSICAL FINDINGS UP TO DATE

New laboratory techniques are becoming available to the clinician almost every day to aid him in diagnosing his patients' ills. With attention focused on these innovations, appreciation of the value of physical signs is likely to suffer. The thoracic roentgenogram is one of the procedures considered by some to have replaced physical examination of the indicated structures. Yet the roentgenologist actually is the first to point out the limitations of the roentgenogram. Like any other laboratory aid, the "chest x-ray" is of value only as it is integrated with total clinical evaluation.

The disrepute of the stethoscope has been marked by statements referring to it as a museum piece. Yet there are many instances in which stethoscopic findings will elicit abnormalities not seen on the standard postero-anterior thoracic roentgenogram. Stethoscopic evaluation of cardiac sounds and murmurs need not be defended. There are numerous other, less commonly appreciated situations in which the physical examination alone may elicit a given abnormality.

Occasionally, as much as 1,500 ml. of pleural fluid may be obscured behind the dome of the diaphragm, and be discovered only by careful percussion and auscultation. Radiolucent foreign bodies in the bronchi may cause only partial luminal obstruction for days or weeks, so that obstructive pneumonitis cannot be seen in the full-inspiration roentgenogram. Yet physical examination in such a condition will reveal an area of decreased breath sounds associated with normal resonance.

Another group of conditions in which the "chest x-ray" may be "negative" includes the spectrum of bronchitis, bronchiectasis and emphysema. Asthma might also be included in this group, the abnormalities usually being cyclic or episodic. Rales, rhonchi and prolongation of the expiratory breath sounds demonstrate obstruction of the airway by bronchospasm, altered bronchial secretions or lack of elastic support from the surrounding pulmonary parenchyma. The presence of decreased breath sounds in underventilated

but distended portions of emphysematous lungs further delineates the abnormalities. Percussion of the level of the depressed diaphragm and demonstration of meager motion, even in the extremes of inspiration and expiration, may tell the clinician of the severity of the disorder. Studies of pulmonary function have depicted graphically the expiratory slowing and impaired distribution of gases found in the presence of these disorders, yet many of these abnormalities may be estimated clinically. These are only a few examples to indicate how physical diagnosis is one key to sound medical practice.

As new laboratory methods become available for measurement of altered function, it is the responsibility of those in clinical fields to correlate the data thus obtained with altered physical signs. Frequently, the correlation is close enough so that the general use of some laboratory procedures is not necessary. Only patients who present difficult diagnostic problems may have to undergo more elaborate studies. If physical findings are to continue to play a major role in the clinical evaluation and care of patients, the physician must continuously adjust his standards of various physical findings to fit new discoveries in the laboratory sciences. This can be done by medical reading and by thoughtful application of new discoveries to the physical examination.

The physician who can make diagnoses only with the aid of a battery of laboratory data degrades himself to the point of doing clerical work, and he loses the art of medicine. Furthermore, he does his patient an injustice professionally and financially. Careful clinical evaluation, supported by the results of a few specifically directed laboratory tests, in most instances will result in a satisfied and properly managed patient. These high standards that our patients set for us call for our constant vigilance and re-evaluation of clinical procedures.

R. DREW MILLER, M.D.

THE MARLBORO(UGH) MAN

Ask any sports fan to give you a description of the Marlboro Man and you get a composite something like this. He's effective, if slightly awkward

with an axe. He has a tattoo on his wrist (the clash of symbols here is variously interpreted: he was once a real heller; he is unable to find a plastic surgeon who is willing to remove the double eagle; in a moment of sheer ecstasy born of smoking a cigarette, the brand of which shall remain anonymous, he leaned against a freshly inked stencil; et cetera). Keen observers suspect that the tattoo shifts from wrist to wrist. He rides a horse, runs a ranch, flies a plane in a swirl of dust. He has a slightly husky voice (one iconoclast has suggested that his titer of androgens has been artificially boosted). And he dexterously manipulates a flip-top box. All-in-all, he is the type of gent whom those wordly wise psychologists, the advertising men, have packed with every gimmick they can dream up to indicate that here is a real he-man who customarily spends his waking hours with a cigarette in each hand and some badge of masculinity in the other.

All this is such common knowledge that a recent paragraph in the News of Science section of *Science** came as a thunderclap out of a clear sky. The paragraph was headed: Marlborough Man. Now this Marlborough Man is different from the Marlboro Man; indeed, no one has proof that the Marlborough Man had lungs, or any other mechanism to permit him to inhale deeply and luxuriously. *Science's* Marlborough Man had "a large head and heavy jaw similar to that of the Boscop Man. (Why doesn't somebody rush off and sell manufacturers on the idea of having a cigarette named Boscop? The singing commercials should be lovely) discovered in South Africa." Further, he is unique because "the skull is that of a man not resembling any existing race living in Africa today. Some features of the bone structure . . . differ from those of both the European and the Bantu." If *Mad Comics* doesn't get there first, we should be able to work this distinctive Marlborough Man into an irresistible selling force.

H.M.

**Science*, 19 April, 1957, p. 731.

THE MATURATION OF THE CARDIOLOGIST

The recent advances in the field of cardiovascular diseases during the past twenty years have resulted in the production of distinct heaves,

thrills, and murmurs in the walls of the house of cardiology. The occupants of said house, needless to say, were quite shaken and depolarized. Some remained depolarized, while the majority quickly underwent repolarization and took stock of the deficiencies of the old building which had stood so long and so well on hallowed ground in an atmosphere of commanding respect. It was quickly appreciated that the foundation, which had been assumed by all to be staunchly constructed and tremor-proof, was constructed, instead of the bricks and mortar of sound scientific research and observation, of a brick veneer of traditional concepts based on grossly (and at times erroneously) related clinico-pathologic findings.

As is the case in all things concerned with our mode of living during these past twenty years, progress has been circumferential. At this point, one might speculate at the concomitant increase in medical research during this same twenty-year span. It is obvious that the basic research done in the early years of this period was instrumental in the erection of a new and much stronger foundation for the house of cardiology. It also became apparent that occupancy of said house was not only much more demanding, but also much more exacting. No longer was the classical portrait of the bedside stethoscopic evaluation of the cardiac disease to be visualized in its time-honored position on the mantel over the fireplace. It, too, became a victim of the new architect and interior decorator. A new era then came into being. The standard three-lead electrocardiogram, with full acknowledgement to Sir Thomas Lewis, Emthoven and Fahr, was placed in a much smaller frame and put in its place on the mantel. It was at this time that the occupants of this house were distinctive among their guests, because they could look at the new portrait above the mantel and interpret it, whereas the guests could not. Thus a "Man of Distinction," to quote a famous slogan, was born, and a label of cardiologist was affixed. The untiring and intrepid efforts of Wilson and Goldberger added a small portrait to the left of the center one in the form of the Unipolar limb leads. On the right side, the portrait of the unipolar precordial leads was hung. Vector cardiography and ballistocardiography were to come later. Thus, for a time, the "portraits" were complete and similarly was the cardiologist. This time interval,

Address given at the Founders Day banquet of the Phi Chi medical fraternity, University of Minnesota, February 13, 1957.

however, was relatively short, as compared to that which had preceded the initial tremor.

Forssman, in 1929, in a remarkable demonstration of courage, passed a ureteral catheter through one of the veins of his right arm until the tip lay within the right atrium. It is also remarkable that this investigator performed the first attempt at selective angiocardiology, by injecting an organic iodine compound, uroselectan, through the catheter in an attempt to visualize the pulmonary vessels. Although unsuccessful, the important impact of this man's unusual and remarkable foresightedness needs no further elaboration. This is attested to in that it was not until 1941 that Cournand described the introduction of a radiopaque catheter into the auricle of a human subject. Three years previous to this, Robb and Steinberg published their results of the intravenous injection of organic iodine compounds for the purpose of delineating the heart and great vessels. Thus, within three years of each other, two of the most important diagnostic techniques available to us were given their initial clinical impetus. Because of their highly technical and somewhat hazardous nature, (and one might in truth, jest, their high cost,) these additional portraits were not immediately available nor earnestly sought for by the cardiologist. They were not ignored, but in passing discussion, it was apparent that they were regarded principally as "tools in the hands of researchers," and as such, would be found only in university centers. This was as it should be, in a sense, until the complete clinical applications had been evaluated and techniques perfected: one wonders at the length of time that these may have lain clinically dormant, had not a guest, not usually present before, knocked and requested admission into the house of cardiology. That this guest was dressed in a white scrub suit was remarkable, indeed, but even more astounding, he was conspicuous by the absence of the usually prominent stethoscope and EKG machine. In their stead, this visitor was seen to have a single instrument grasped tightly in his right hand. This was a scalpel. In such manner did the visitor enter into the hallowed premises of the cardiologist and internist. One might theoretically state that he was not as well received as was the prodigal son. It soon became apparent that this individual was also a portrait painter of note, as evidenced by the initial portraits of intracardiac

and extracardiac surgery. Thus, in 1944, Blalock, Gross, and Crafoord successfully attacked coarctation of the aorta. The year 1945 saw Blalock attack pulmonary stenosis by creation of his shunt anastomosis, and this year also saw Bailey open up the field of valvular surgery by his direct attack on a stenotic mitral valve. One year later, Potts gave a description of his procedure. Brock and Sellers, in 1948, successfully attacked the stenotic pulmonary valve.

The surgical entrance into the treatment of cardiovascular disease did not take place overnight. Many hours, weeks and months of tedious and arduous experimental surgical procedures were tried and tested in the dog laboratory. Only as a result of this was human surgical intervention made possible. This combination of the dog laboratory and the operating table began to unfold to the eyes of the surgeon the physiologic and anatomic aberrations of the various acquired and congenital cardiac disease states. A greater appreciation and knowledge of the pathologic physiology followed, which began to become manifest in the greater number of portraits hung on the wall of the house of cardiology by the man with the scalpel in his hand. It also became apparent that of the many guests present, his voice began to become more dominant and authoritative. That this should happen, in a sense, was inevitable, since who was in a better position to evaluate and correlate at first hand not only the altered pathologic anatomy, but the pathologic physiology as well?

To the cardiologist, such a dominant voice in his own house became a challenge. Although many of the surgical steps described above were accompanied by equally important medical steps, this was not prevalent at first in regard to the number of cardiologists. Thus cardiac catheterization, with its valuable information of cardiac hemodynamics, was utilized more and more as a routine clinical diagnostic tool and not solely as an investigative procedure of research nature. The cardiologist began to integrate, as well, the results of peripheral and central angiocardiology with his other studies. He began to return the visits of his surgical colleague by being present at the operating table to see with his own eyes the gross anatomical variations attendant upon the different types of congenital and acquired diseases of the cardiovascular system. He became an integral part of the team, con-

tributing to the preoperative and postoperative management of the patient. In addition to the preliminary diagnostic procedures he had instituted in order to present to the surgeon the exact diagnosis, he also detailed the physiologic consequences of such disease, in the form of accurately determined scientific data. In such manner did men like Cournand, Dexter, Bing, Wood, and others enhance, establish, and cast the cardiologist in a scientifically clinical mold.

In closing, let us retrace and simplify this process of maturing of the cardiologist. As we survey the various portraits which are hung in their respective positions on the four walls of the house of cardiology, it becomes apparent that each portrait represents a part of the whole. That is, the portrait can not be complete until the assembling process has occurred. Thus, we must go back to that portrait which had been taken down, depicting the cardiologist at the bedside. The fundamentals of the cardiologist are still there, i.e., the potentiality of a trained mind to see the patient and to evaluate the sounds which the stethoscope conveys to his ears. We see the final maturing of the cardiologist as a complete and finished portrait, when the basic understanding of electrocardiography, cardiac roentgenography, cardiac catheterization, angiocardiology, technique of corrective surgical procedures, as well as preoperative and postoperative cardiac management as represented by the small portraits, are integrated with the basic large portrait mentioned above. Then can the large portrait truly hang once again in its revered place on the mantel above the fireplace in the house of cardiology.

WM. F. MAZZITELLO, M.D.

BOOKPLATE LETTERING AND REFERENCES

Lettering

This is the sixth and last of the articles on bookplates. The earlier ones told of their history, the customs of collecting and exhibiting, their preservation, size and material, and the various kinds of plates for their printing.

If you are making the design yourself, remember the one word "accuracy." This is perhaps more necessary in the making of bookplates than in any other line of art. Harold W. Kearney, in an article in the *Bookplate Chronicle*, says,

"Take every precaution to insure accuracy. If lines are to be parallel see that they are parallel to the last infinitesimal fraction of a hair's-breadth. Do not cherish the false hope that little inaccuracies will be lost in the general effect; they are almost as ineffaceable as the sins that are chalked against us in the book of the recording angel, and will point accusing fingers at you forevermore. You will find this particularly true of your lettering."

If you are not to make the drawing yourself, then find the artist who can do it most to your liking. He will charge you whatever he may think right, perhaps \$25.00, perhaps \$200.00. You say, "So much for such a little thing?" Yes, but remember it may be a gem. And then again the designers have no corner on the making of bookplates. You may start in and do it for yourself.

References

Books easily understood, and well illustrated with examples are:

- "Bookplates for Beginners" by Alfred Fowler, Kansas City. 1922.
- "Some American College Bookplates" by Harry Parker Ward, Columbus. 1915.
- "The Book of Artists' Own Bookplates" by Ruth Thomson Saunders. Saunders Studio Press, Claremont, California. 1933.

The American Society of Bookplate Collectors and Designers was founded in 1922, and has published Year Books since 1923. A printed Index of these exquisite booklets "1923 to 1950" has been issued. Membership is limited and is obtained by sending name and address to the Secretary with three prints of your bookplate, or bookplates, with a statement as to the name of designer, engraver or etcher and year produced, accompanied by the annual fee of \$4.00. There is no initiation fee. Annual fee includes Year Book and *Bulletin* containing an exchange list. Carlyle S. Baer, Secretary-Treasurer, 3333 McKinley Street, N.W., Washington 15, D. C., is the person with whom to correspond. Membership includes people of other countries. This society does not hold exhibitions of the current work of its members as did its forerunner, the American Bookplate Society, in New York from 1916 to 1926. Instead it puts their work into a special collection at the Division of Fine Arts, Library of Congress, Washington, D. C., and publishes the Year Book "of information of interest to members with reviews of the work of bookplate artists with examples of their work."

The Bookplate Association International held

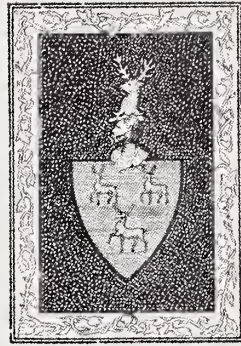


CHARLES EUGENE RIGGS M.D.

EX LIBRIS



MILDRED ALDRICH



Samuel Greene Rea
Josephine Dearth Rea



GEORGE HARRISON PRINCE



Frank E. Dorch



FRANK S. BRIGGS



WYERHAEUSER
HIS BOOK



THOMAS LEONARD DANIELS

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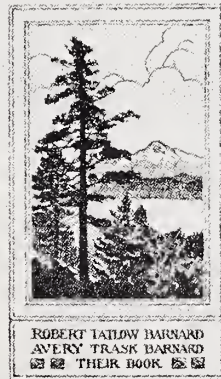


CLEORA CLARK WHEELER

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FROST MONTANE AND
EMMA HOLLIS WHEELER



ROBERT TALLOW BARNARD
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THEIR BOOK

its exhibitions from the time of its organization, 1925, annually for twelve years (1936 inclusive). This was in the period between World War I and World War II, and then conditions made it impossible to continue.

Because of the fact that bookplates have permanence, and a recognized place in the field of art, young designers can submit their original drawings under the division "Black and White" in almost any art exhibition in the United States, and have them judged by an art jury of distinguished persons. Awards from such juries are worth a great deal to a designer who is building recognition for his or her work. Even if an award is not received, it is an honor to have one's work accepted by such a jury of admissions, and the young artist who is supposed to exhibit once a year, somewhere, in order to maintain professional standing, has the satisfaction not only of doing creative work but of meeting art requirements successfully.

CLEORA WHEELER,
Designer and Illuminator

CONFESSIONS OF A HOBBYIST

Color Printing

Making a really fine color print—not the 75-cent kind with false colors and fugitive dyes—is a one-way trip to a padded cell. When you've tried it, you think of Mr. Eastman's charge of \$25 up, not as robbery, but as philanthropy. The cost is not in the materials, but in the time and the skill, for the process is a combination of chemistry, physics, mathematics, optics, and delicate and accurate manual dexterity. If the transparency from which you work is 35mm., the cell needs double padding. For fifteen years, I've been making such prints from transparencies of wildflowers, and now—sometimes—they come out gorgeously. Sometimes, not!

The process is called "double-masked dye-transfer." Two diffuse negatives, called "masks," are first made from the transparency, one through a red filter and one through a green filter. These are taped in register with the transparency, the first while red and green filter "separation negatives" are being exposed, and the second while the blue filter "separation" is exposed. The function of the masks is to cut off the overlap between the spectral curves of the three dyes, thus purifying the colors, especially the reds and greens. Each filter, in turn, blocks out one of the three

primary colors—blue-green (cyan), magenta, and yellow. Separations and masks must be processed in complete darkness, and the blue-filter separation is developed three minutes more than the other two. From each separation, by enlargement, is made a "matrix," exposed through the back of a special film. In development, the matrices are "tanned" so that the silver image is impervious to considerable heat. The developed matrices are flooded with water at 120 degrees, and this melts off the gelatine where there is no silver image, leaving a "relief." The three reliefs are dyed with the three primary colors, cyan, magenta and yellow. The three dyed images are then transferred, successively, in register, to specially prepared paper. The result is a color print, closely approximating the transparency. Exposure times are determined by densitometer readings, and calculated mathematically. Timings and temperatures must be exact. A small error in timing, density measurement, calculation, temperature, or manipulation results in a cast, if not a predominance, of false color. Done precisely, the results are beautiful. The first time I tried this process, it took twenty-two hours to make a very bad print. Now, including drying times, it takes about five hours. After the matrices are made, duplicate prints can be made in about half an hour. It is a fascinating and challenging process, frequently frustrating and depressing, but sometimes thrillingly rewarding.

JOHN DEQ. BRIGGS

SAFETY GLASS IN YOUR CAR

Safety glass was one of the early safety devices built into a motor car. After nearly thirty years' acquaintance with it, the average car owner thinks very little about it, how it functions, how it has been improved from year to year, and how it has taken on added functions of providing comfort and greater quantity of vision. Safety glass is considered as commonplace as brakes, bumpers, and seat cushions.

But to get the utmost value in personal comfort and effectiveness in driving your car, it is well to know something about safety glass.

There are two kinds of safety glass used in most modern cars—(1) laminated safety glass in which a sheet of polyvinyl butyral plastic is sandwiched between two panes of glass and the whole subjected to a cycle of heat and pressure in an autoclave making it into a transparent unitary

structure, which clings together even if fractured, and which yields with its tough plastic interlayer if struck by a heavy object. Then there is (2) solid safety glass which is used largely on backlights of cars, sometimes in sidelights and smaller wind vents, which is a heat-tempered glass achieving five to six times the strength of ordinary glass and added toughness and flexibility through the molecular action achieved in a case hardening treatment.

Laminated safety glass may be made from two pieces of ordinary window glass or, in a quality product, from two pieces of $\frac{1}{8}$ -inch polished plate glass which give it the characteristics of a precision optical unit. The solid safety glass usually starts with quarter-inch plate glass but may be made, as it is in some foreign cars, of thick window glass. Laminated safety glass is by very nature also more expensive to manufacture than solid safety glass.

Plate glass is a product superior to window glass and has been so recognized down through several centuries. However, even polished plate glass has been greatly improved in recent years.

From the very early days of American motor car development, safety plate glass has been specified for all windshields because of the importance of maximum forward vision.

State codes require an identifying etch on each piece of safety glass. Only where this etch contains the letters P-L-A-T-E, either as a separate word or as part of a coined word, is the consumer assured of getting top quality glass. That is all the car owner needs to know about the intricate manufacturing techniques and the immense amount of technology which has gone into the modern safety glass. If he sees the word "plate" on the label, he knows he has the best and most distortion-free product.

Some motor car manufacturers use safety plate glass all around the car in every unit of glass. Others use some window or sheet glass for side lights. Quite universally in America, safety plate is used for the windshield and solid safety plate for the rear light.

In the very process of making window glass or as it is known in the trade, sheet glass, there is a certain amount of resulting waviness or distortion in the glass—not nearly so much as in the old hand-blown window glass days—but substantial as compared with modern plate glass. For the purpose of a window—to let in light, to

open for ventilation, and to keep out wind and weather—slight distortions are not objectionable because nature and seasonal views are mostly static. For good vision, as in a picture window, a store front or a fine mirror, one always uses polished plate glass.

In a moving automobile, from which passengers always are looking outward to view rapidly passing scenery, the difference between safety sheet and safety plate glass is at once apparent.

Side windows of automobiles may induce in auto passengers a temporary condition resembling the eye-defect known as aniseikonia, explained by the late Dr. Adelbert Ames, Jr., and Dr. Kenneth N. Ogle, at Dartmouth College. This defect results in a difference in size of images seen by each eye.

"To persons with this defect, a curbstone may appear higher than it is, flat surfaces may not look level, objects may seem closer or farther away than they are," it was explained. "Headaches, nausea, eye strain and dizziness are not uncommon symptoms, depending, of course, upon the degree to which the sufferer is affected."

Scientists have found that the waves in sheet glass, when used in side windows of a moving motor car, may produce a temporary condition closely resembling aniseikonia. This is not true of safety plate glass.

Therefore, for the best possible visual conditions for motoring, one first should examine the windows in his car and insist upon a motor car with all important windows officially labeled safety plate glass.

WILFRID HIBBERT

Libbey-Owens-Ford Glass Company

PHI BETA PI MAN OF THE YEAR

Walter A. Fansler, M.D., Minneapolis, has been chosen Phi Beta Pi Man of the Year by the Phi Beta Pi National Medical Fraternity. Each year, this organization selects one of its outstanding members for this honor. The October issue of the national publication of this fraternity, *The Quarterly*, honors Doctor Fansler and his many achievements as physician, teacher and a builder of the Fraternity. This includes an interesting bibliographic sketch depicting his career up to the present.

In the fraternity world, Doctor Fansler helped establish several chapters of Phi Beta Pi in medi-

(Continued on Page 816)

President's Letter

SOCIAL SECURITY FOR PHYSICIANS

The problem of the old age and survivors' insurance administered by the Federal Social Security Administration, as this problem relates to physicians, has been controversial in medical circles for some years. Since Bismarck introduced socialized medicine in Germany three-quarters of a century ago, the spread of socialized medicine by means of extension of so-called social insurance has been ever-present in Western civilization. One nation after another has yielded to the clamor to extend the compulsory system of taxation called "social insurance" to finance a program of medical and hospital care.

The history of the development of this field in foreign countries has alerted members of the American medical profession to the consequences of the Federal Social Security program. Most physicians who conduct their own private practices of medicine do not retire, nor do they have any intention, during their early professional lives, of retiring at a given age. Currently, about six physicians of seven in the age group between 65 and 75 years are engaged in the active private practice of medicine. Since, as we have said, most physicians in this category do not retire, the tax imposed upon them by extending old age and survivors' insurance to them would be unjust and unreasonable. That is, they would be required to pay the tax in question long after most gainfully employed persons in their respective occupations have ceased to pay it and have begun to receive their Federal benefits.

Actually, the program of social security is not an "insurance" program. Retired beneficiaries of old age and survivors' insurance, as of December, 1952, have received, and would receive, on the average, pension benefits equal to approximately \$24 for each 50 cents paid during the working years of their lives. By the amendments in 1954, this amount has been raised to \$30.

Physicians, as a group, do not seek Federal gratuities. In preference to compulsory inclusion under the Social Security Act, members of the medical profession are giving their active support to the Jenkins-Keogh bills. These bills would amend the Federal internal revenue code so that self-employed physicians and others would have the same tax-deferment advantages on the amount set aside for retirement as are now enjoyed by officers and employees of corporations, associations and others. The bills would provide tax incentive for the acquisition of prepaid pensions for all who are willing to save. It is proposed that some tax exemption be allowed on money which self-employed persons invest in the pension to provide for their future.

The equitable aspect of this idea is that most persons in effect already enjoy such tax exemption. That is, the money paid by an employer to workers' pension funds is usually regarded as a cost of doing business. This money is not taxable in respect to either employer or employee. Great Britain's budget of 1956 contains such a provision. President Eisenhower has endorsed the idea.

PRESIDENT'S LETTER

Physicians, generally, by no means are all of one mind in regard to this problem. The question has come before the House of Delegates of the American Medical Association on several occasions. The most recent action was taken at the midyear meeting in Boston, November 29 to December 1, 1955, at which a resolution was passed to provide for a survey of the medical profession, by state societies, on the subject of the Social Security Act. In this resolution was the recommendation of the House of Delegates of the American Medical Association that individual state societies poll their entire membership on this question.

At that time, the House of Delegates re-affirmed its opposition to the compulsory inclusion of physicians on the Social Security rolls, but further resolved that the House of Delegates was not in opposition to the voluntary inclusion of physicians in the Social Security system.

Consequently, on or about May 1, 1956, all the members of the Minnesota State Medical Association received a card asking their opinion on this problem. Within two weeks after the cards had been sent out, 65 per cent of the membership replied in a manner which indicated an overwhelming trend in favor of voluntary coverage. An analysis of the replies received at the end of one week indicated that only 12 per cent of the physicians favored compulsory coverage, 61 per cent favored voluntary, and 27 per cent opposed any type of Social Security coverage. This trend continued as the replies were returned.

After these replies had been analyzed, and after a long discussion of the subject, the House of Delegates decided to take no action upon the resolution which had been introduced into the House of Delegates and which read as follows: "Be it therefore resolved that the House of Delegates of the Minnesota State Medical Association in session at Rochester, May 21, 1956, go on record as officially opposing the extension of the Social Security benefits to the physicians of the medical profession on either a voluntary or a compulsory basis and that the matter be returned to the various county medical societies for careful, thoughtful consideration."

This action apparently was misunderstood in many quarters. It was evident that the majority of physicians favored voluntary coverage by Social Security insurance. It was also evident that the vast majority opposed compulsory coverage. Because of this confusion, it seemed wise for the Minnesota State Medical Association to conduct another poll. Hence, soon after January 1, you will receive cards in which you are asked to express your opinion. I trust that when the returns from this canvass are recorded, everyone will understand very clearly where the physicians of Minnesota stand in regard to Social Security insurance for physicians.

A large, elegant handwritten signature in dark ink, reading "J. M. Bergen". The signature is written in a cursive style with a large, looping initial "J" and a long, sweeping underline.

President, Minnesota State Medical Association

HOSPITAL AND SURGICAL CARE THROUGH INSURANCE COMPANY POLICIES

There were 66.3 million persons covered for hospital expenses at the end of 1956 through individual and family health policies and through group insurance programs. This represents a 79 per cent increase over the 1950 total of 37 million.

In 1954, there was an increase of 5.9 per cent over 1953 in the number of people covered, the percentage gain in 1955 over 1954 was 7.9 per cent, and the rate of growth in 1956 over 1955 was 11.1 per cent.

Surgical expense insurance included some 63 million persons covered in 1956, compared with the 1950 total of 33 million, an increase of 91 per cent.

The number of people with insurance policies covering surgical expenses during the past three years increased as follows: 1954 was 4.6 per cent over 1953; in 1955 the increase was 7.3 per cent over 1954; and 1956 recorded a rise of 11.2 per cent in the number of people protected over the comparable period for 1955.

Regular medical expense coverage, providing for doctor visits for non-surgical care, rose 281 per cent in the number of people covered between 1950 and 1956, for a total of 29.8 million persons as compared with 7.8 million in 1950.

In 1954, regular medical expense insurance increased 12.9 per cent over 1953, and a rate of growth of 20.8 per cent between 1954 and 1955. In 1956, the increase in the number of people was 18.9 per cent over 1955.

Major medical insurance led all other forms of coverage in percentage of increase. Medical expense policies help cover the costs of serious, or catastrophic illness, including hospital bills, physicians' charges and other medical care services, and are available alone or as a supplement to the other types of expense policies.

At the end of 1952, there were some 689,000 persons in the nation with major medical coverage. In the four years since, this form of health insurance rose 1188 per cent, for a total in 1956 of 8.9 million persons.

Recent estimates indicate that as of May 1, 1957, the total exceeded 10 million persons.

RECORD NUMBER OF HEALTH-MEDICAL BILLS ENACTED BY 85TH CONGRESS

A record total of 441 health-medical bills were introduced in the 85th Congress. Action was deferred on a majority for a variety of reasons, including desire for more extensive hearings, economy, and possible inclination to save popular appeal bills for an election year, second session. The following is a résumé of health legislation enacted:

Doctor Draft Extension (P.L. 85-62)—Gives Selective Service authority until July 1, 1959 (when both this amendment and the regular draft expire) to call certain physicians up to age 35 for military service. Only those under age 35 with obligations under the regular draft and who have been deferred for any reason may be called. Defense Department, meanwhile, says it is getting enough medical school graduates as reservists to preclude use of the new law at this time.

Medical Research (P.L. 85-67)—Another early enactment was the fiscal 1958 budget for the Department of Health, Education, and Welfare. Congress voted \$2,503,130,381 for all HEW programs, including record high totals for medical research through the National Institutes of Health.

Vendor Medical Payments (P.L. 85-110)—With regard to federal participation in the categorical welfare programs, it gives states the choice of either (a) using federal funds for vendor medical payments within the \$60 a month per recipient maximum or (b) establishing a single medical vendor payment financed by federal funds which were set by a 1956 law at one-half of \$6 a month per adult and one-half of \$3 per child, to be matched by states. States can also continue to make direct payments to recipients for medical and subsistence expenses.

The Minnesota Department of Public Welfare has chosen the latter program, (b) with the \$6.00 fund being used for direct vendor payments for

nursing home care. Payments for all other medical care expenses are made to the recipient. The Department adopted this method of payment to enable Minnesota to receive the maximum amount of federal funds obtainable. A proposed amendment considered by Congress and strongly supported by several states, including Minnesota, would have permitted vendor medical payments from both the \$60.00 and the \$6.00 funds, but was rejected by Congress ostensibly for purposes of economy of expenditure of federal funds.

Disability Freeze Extension (P.L. 85-109)—A new deadline of July 1, 1958 is established for disabled persons covered under social security to apply for full retroactivity under the disability freeze passed in 1954. Applications filed by next July will allow workers to count the full period of disability, provided they were eligible for disability benefits at the time the disability was incurred. After next July 1, any period of disability established for a worker cannot begin earlier than one year before the application is filed.

Indian & Non-Indian Hospitals (P.L. 85-151)—Authorizes federal funds to help build non-profit or public hospitals and diagnostic or treatment centers on or near Indian reservations; the extent of federal contribution will be determined by the percentage of care given eligible Indians. The facilities have to agree to care for both Indians and non-Indians.

Vocational Rehab Traineeships (P.L. 85-198)—Extends from two to three years the maximum period of time over which the federal government can pay for partial financing of traineeships in physical medicine and rehabilitation. It amends the Vocational Rehabilitation Act which was expanded in the 84th Congress.

Vocational Rehab Planning (P.L. 85-213)—Amends the Vocational Rehab Act by extending the time federal funds may be used for planning, preparing and initiating expansion of programs in the states.

Codification Veterans Laws (P.L. 85-56)—Brings into a single code all veterans benefit laws, including those providing for hospital and medical care.

Poultry Inspection (P.L. 85-172)—Under this

law, federal inspection of poultry moved in interstate commerce becomes compulsory.

Military Nurses Incentives (P.L. 85-155)—In line with earlier efforts to make careers in the military more attractive, Congress passed this law improving career prospects for military nurses by making more and higher ranks available.

MEDICAL SOCIETIES TO BASE FEES ON PRICE INDEX

Eighty-five per cent of the 507 physicians in Long Beach, California, have adopted the Physicians Health Plan. According to the terms of the plan, physicians will charge fees based on the cost-of-living index of the Bureau of Labor Statistics.

For instance, if the index rises appreciably, medical and surgical fees will rise proportionately. If the index drops, fees will be lowered accordingly. Variations of less than 5 per cent will be ignored.

The group has adopted the California State Medical Association's "relative value" fee guide which bases the relative value of specific medical and surgical procedures—one in relation to another—rather than on a fixed dollar value.

The four schedules, medicine, surgery, radiology and pathology, include approximately 1,200 procedures. By accepting this schedule, doctors participating in the Long Beach Physicians Health Plan will now be paid rates about 25 per cent higher than they have been receiving since 1955 when the plan was started.

The Long Beach Plan has set a local unit value of \$5.00 which all participating physicians have accepted as constant. For example, a routine office call after the patient's first visit is rated as one unit; house calls, two units; and night calls, two-and-a-half units.

Accordingly, the plan pays \$175.00 for an appendectomy, valued at thirty-five units under the state code, and member-doctors agree not to charge more.

The Long Beach Plan which was established as a service program without income ceiling or age limitations, offers medical, surgical and hospital benefits. The Plan has Blue Shield backing, but it can offer wider coverage than the state Blue Shield Plan (California Physicians' Service), which has \$4,200 and \$6,000 income ceilings in an area served by the Kaiser Foundation Health Plan and other plans without income limits.

The Long Beach Plan is now open to any employee group of twenty-five persons or more. In its early years it was limited to groups of 100 or more. About 5,000 persons are now covered—an increase of 90 per cent in the last year.

Regardless of income, the subscriber pays no additional fees to physicians participating in the Plan and is free to go to the doctor of his choice.

PHYSICIANS VOICE OBJECTIONS TO MEDICARE "RED TAPE"

Physicians rather than Medicare dependents are the chief source of complaint to the United States Defense Department.

The Department's first interim report disclosed that physicians objected to the many forms to be filled out in conjunction with Medicare cases.

Another complaint cited by physicians was the constant necessity of checking with Medicare manuals to determine whether or not a certain type of care is covered.

The Defense Department comments that physicians are performing "admirably" even though many object to "government intervention," full-service contracts, and the load of paper work.

The report further disclosed that 127,902 physician claims averaging \$68.84 and 103,595 hospital claims averaging \$103.60, were filed in the six-months period ending July 1, 1957.

A special eight-state study included in the report showed that physicians handled more maternity cases than any other type, at an average physician-hospital cost of \$224. Tonsillectomy, at \$113 per case, was also high on the list, followed by respiratory infections and gynecological conditions.

VA HOSPITAL NEEDS CITED

Congress may soon be asked to decide whether facilities of VA hospitals are to be expanded to care for non-service-connected cases.

Veterans Administration officials point out that patient loads are relatively stable at present. The average daily patient load in all hospitals is 112,499, with 109,579 patients in VA hospitals and 2,920 in non-VA hospitals. It is estimated that there are more than 22,000 eligible hospitalization applicants awaiting admission.

Service-connected cases account for one-third of the daily VA hospital load and non-service-connected cases, two-thirds. Present VA policies base non-service-connected admission on the basis of extra beds not required for service-connected cases.

PHI BETA PI MAN OF THE YEAR

(Continued from Page 811)

cal schools from coast to coast. He has held the highest offices in this organization including that of Supreme Archon and Supreme Editor of *The Quarterly*. At the present time, he is Chairman of the Expansion Committee and a member of the Board of Trustees.

In the medical world, he has gained an international reputation as surgeon and author. Presently, he is Clinical Professor of Surgery and Director of the Department of Proctology at the University of Minnesota. He is a founder and Past President of the American Board of Proctology, a certifying group for specialists in this field. In addition, a few of his achievements include: Fellow and Past President, American Proctologic Society; Honorary Fellow, Philadelphia Proctologic Society and Fellow of the American College of Surgeons.

In Minneapolis, among other interests, Doctor Fansler is a member of the Minneapolis Academy of Medicine, is an enthusiastic Rotarian and a Guarantor of the Minneapolis Symphony Orchestra.

WILLIAM T. SMITH, M.D.

EVALUATION AND MANAGEMENT OF MINOR CONTUSIONS OF THE EYE

(Continued from Page 765)

Conclusion

A careful analysis of any minor contusion of the globe will undoubtedly show the presence of two to six of the many sequelae mentioned—all obviously related anatomically to one another, and stretching from the conjunctiva, cornea and anterior chamber to the iris, the iris root, ciliary body, zonule, lens, ora serrata, vitreous, retina and choroid. The most important effects of contusion are the tears and lacerations of the anterior and posterior uveal tract with hemorrhage, subluxation or dislocation of the lens and damage to the retina.

Treatment of most of these lesions is confined to bed rest, sedation, and bandaging of the eyes until the danger of hemorrhage is past.

For medicolegal reasons the importance of a concise but detailed history and the recording of all pertinent findings and observations is stressed.

Committee Action

Hospitals and Medical Education Report for the Year 1956-1957

The following is an abridgment of the report submitted to the Council and to the House of Delegates of the Minnesota State Medical Association at the annual meeting of the Association, May 13 to 15, 1957. The committee held one meeting, on December 6, 1956, in Minneapolis.

Hospital Construction in Minnesota

The committee noted with pleasure the report of the Minnesota Department of Health indicating that during 1956 six new hospitals in the state were completed while seven more were under construction, that nine hospitals had completed building programs resulting in additional or improved facilities, while similar building programs were under way in nineteen others, and that public health centers were under construction in both Saint Paul and Minneapolis. Sixteen of the programs were accomplished with the assistance of the Hill-Burton program, the remainder without such assistance. Altogether, 1266 new hospital beds will be provided by these projects, including 1119 actual additional beds and replacement of 147 beds formerly housed in nonfire-resistant structures.

During the year, ninety-nine general hospitals, admitting more than 80 per cent of all patients admitted to general hospitals, performed routine admission chest x-rays.

Attention should be called to the fact that, although Minnesota has received slightly less than \$20 million in Hill-Burton funds since the program started in 1948, the total estimated volume of construction completed, now under way, or in the planning stage, approximates \$250 million in the field of hospitals and related facilities.

Medical Students

In June, 1956, 116 students, and in June, 1957, 110 students were awarded the Doctor of Medicine degree by the University of Minnesota. The number of students admitted to the Medical School in September, 1956, was 127. Approximately the same number will be admitted in September, 1957.

Graduate Medical Training

The State of Minnesota continues to occupy a leading place nationally and internationally in graduate training in medicine, almost all of which is carried out under the Graduate School of the

Hospital Construction in Minnesota
Medical Students
Graduate Medical Training
Continuation Medical Education
Nursing
Medical Technology
Laboratory Aide Program

University. During the 1956-57 academic year, 1,037 graduate students were enrolled in the basic medical sciences and the clinical specialties of medicine. This figure includes 591 graduate students enrolled in the Mayo Foundation program in Rochester and 446 enrolled in the Medical School program in Minneapolis, which utilizes for graduate training in the clinical fields not only the University of Minnesota Hospitals, but also Minneapolis General Hospital, Minneapolis Veterans Administration Hospital, Ancker Hospital in Saint Paul, the Gillette State Hospital, and several private hospitals in the Twin Cities. The demand for graduate training in various specialties of medical practice is somewhat less than a few years ago, but the reputations of the University of Minnesota Medical School and the Mayo Foundation attract large numbers of applicants in most areas. Vacancies, however, continue in most of the basic medical sciences as well as in psychiatry, rehabilitation, and anesthesiology.

Continuation Medical Education

The Department of Continuation Medical Education, which presents each year a series of continuation courses for physicians, continues to provide the practicing physicians of Minnesota with an opportunity to review significant fundamental material and to learn of important advances in medical practice. The unique facilities of the Center for Continuation Study provide an atmosphere especially conducive to learning.

During the 1955-56 academic year, 1,304 physicians attended twenty-two courses at the Center for Continuation Study. All but four of these courses were intended primarily for physicians engaged in general practice. During the 1956-57 academic year, twenty-one courses, fifteen of them primarily for general physicians, have been or will be presented. Preliminary figures indicate that attendance during the current academic year will surpass that of last year. Since the fall of 1955, in addition to courses presented at the Center, regional seminars for physicians have been presented in Alexandria, Marshall, Fairmont, Chisholm, New Ulm, and Hibbing by the University, in conjunction with the Minnesota State Medical Association and local medical groups.

The Department of Continuation Medical Education also is responsible for the planning and

presentation of continuation courses for nurses, medical technologists, and dietitians. These programs continue to be well received.

Nursing

The provision of adequate nursing remains a difficult problem in certain areas of the state, particularly those in which new hospitals have been constructed or existing hospitals expanded. Minnesota, however, is distinctly above the national average in the number of nurses per 100,000 population. A survey showed that 7,588 professional nurses were actively engaged in nursing in Minnesota during 1956. Of these 5,317 were employed in hospitals and similar institutions, 693 were performing private duty nursing, 432 were engaged in public health nursing, 361 were employed in office service, and 785 in other fields of nursing.

Seven of Minnesota's twenty-eight schools of nursing have four-year degree programs. Although Minnesota ranks nineteenth in population, only seven states have more nursing students. More nurses are graduated by Minnesota schools than by the nursing schools of any of the neighboring states.

Practical nursing training is carried chiefly by vocational education departments of school systems in conjunction with local hospitals. On January 1, 1957, Minnesota had fourteen schools of practical nursing and four additional schools are expected to open during the year. A new development in Minnesota is the preparation of nonprofessional nursing personnel for the care of psychiatric patients.

Education for advanced professional nursing—administrative, teaching, supervisory, and public health nursing—is centered in the University of Minnesota, which trains more teachers of nursing than any other institution in the country.

Rural community nursing is a part of the basic educational program of many schools of nursing in Minnesota. Experience for students is provided through affiliation with community hospitals outside the metropolitan areas of the state. Schools of nursing in Minneapolis, Saint Paul, and Duluth assign students to community hospitals in Bemidji, Benson, Fairmont, Grand Rapids, Hibbing, Litchfield, Pipestone, Sauk Centre, Sleepy Eye, Stillwater, Thief River Falls, and Worthington. The University of Minnesota provides the direction and co-ordination of this program.

Special educational nursing services in the state include extension classes, workshops, and institutes. Since 1951, the Minnesota State Student Nurse Scholarship Act has provided more than 1,400 scholarships. A survey of students graduated in 1955 indicated that 65 per cent are employed in counties of more than 100,000 population, while 31 per cent are serving in smaller communities. Four per cent failed to respond to the questionnaire.

Medical Technology

Although in the past few years the number of students completing requirements for the four-year degree program in Medical Technology has been below normal, the present indication of slight increases in the number of students in this program is encouraging.

Last fall the increase in numbers of students transferring into the third year at the University from the junior colleges within the state was a hopeful sign. In 1956-57, fourteen students transferred here while the year before only two students transferred at the third year level, directly contributing to the present small senior class.

The increasing need in the state for the services of the professional graduate medical technologist serves to emphasize the present critical shortage of laboratory personnel. Continued and vigorous efforts toward recruitment of students are urgently recommended.

Laboratory Aide Program

During the past year the Laboratory Aide Program has been expanded by the inclusion of four additional hospitals outside the Twin Cities area for clinical training of students. Newly participating hospitals include Our Lady of Mercy Hospital, Alexandria; Miller Memorial Hospital, Duluth; Virginia Municipal Hospital; and Community Memorial Hospital, New Prague.

At present, twenty-one students are being trained in technical laboratory procedures at twelve hospitals in the Twin Cities and eight institutions outside the Twin Cities. Of the seven students trained during 1955-56 in the hospitals outside the Twin Cities, all are currently employed in hospitals and doctors' offices outside the metropolitan area.

General awareness of the Laboratory Aide Program appears to be increasing, and enrollment in it may be expected to rise. Future expansion of the program should be contemplated if necessary financial support is available.

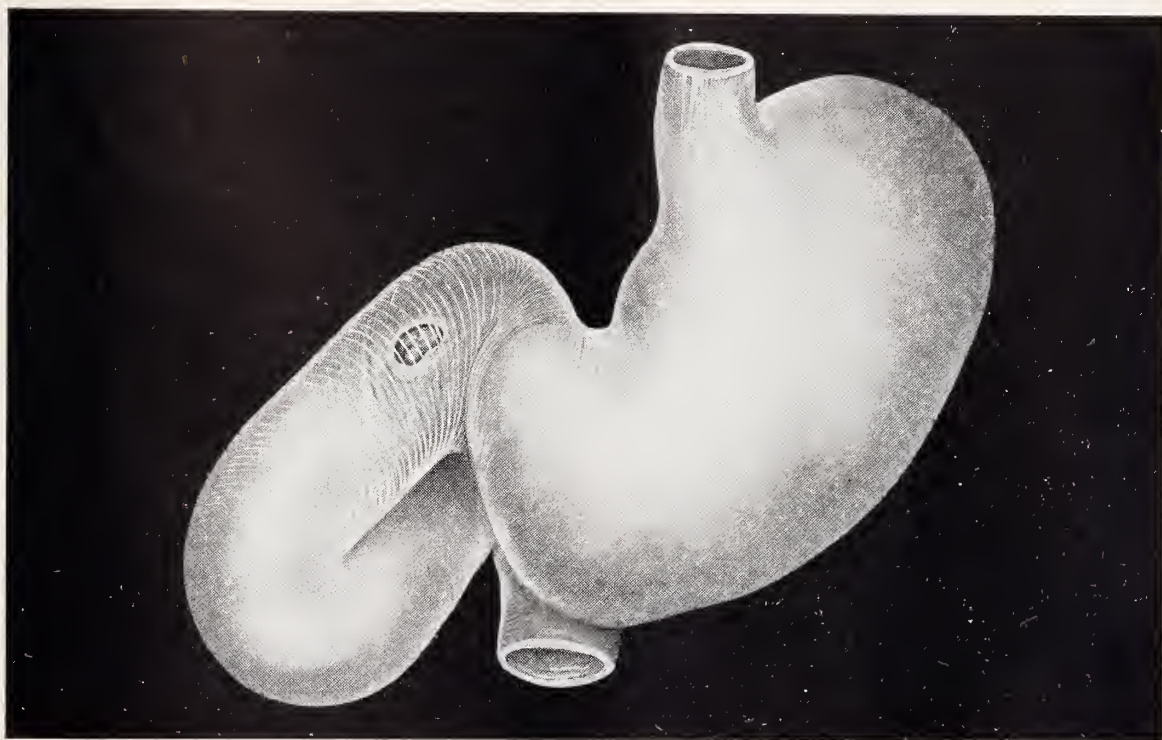
HAROLD S. DIEHL, M.D.,
*Chairman, Committee on Medical
Education and Hospitals*

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G. D. Searle & Co., Chicago 80, Illinois.
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*Lichstein, J.; Morehouse, M. G., and Osmon, K. L.: Pro-Banthine in the Treatment of Peptic Ulcer. A Clinical Evaluation with Gastric Secretory, Motility and Gastroscopic Studies. Report of 60 Cases, Am. J. M. Sc. 232:156 (Aug.) 1956.

SEARLE

Meetings and Announcements

STATE

MINNESOTA STATE MEDICAL ASSOCIATION, 105th annual meeting, Minneapolis, May 22, 23 and 24, 1958. Business sessions and exhibits, Minneapolis Auditorium. Headquarters, Leamington Hotel.

NATIONAL

American College of Surgeons, sectional meeting, Des Moines, Iowa, March 27-29, 1958.

American Gastroenterological Association, 59th annual meeting, Washington, D. C., May 30-31, 1958. H. M. Pollard, M.D., Secretary-General, University Hospital, Ann Arbor, Michigan.

Symposium on Fluorides, Institute of Industrial Health, College of Medicine, University of Cincinnati, Cincinnati, Ohio, December 9-11, 1957. Secretary, Institute of Industrial Health, Kettering Laboratory, Eden and Bethesda Avenues, Cincinnati 19, Ohio.

INTERNATIONAL

Fifth International Congress on Diseases of the Chest, sponsored by American College of Chest Physicians, Tokyo, Japan, September 7-11, 1958.

Fifth International Congress of Internal Medicine, Philadelphia, Pennsylvania, April 24-26, 1958. Edward R. Loveland, Secretary-General, 4200 Pine Street, Philadelphia 4, Pennsylvania.

International Society of Internal Medicine, Fifth International Congress of Internal Medicine, Philadelphia, Pennsylvania, April 24-26, 1958. Edward R. Loveland, Secretary-General, 4200 Pine Street, Philadelphia 4, Pennsylvania.

World Congress of Gastroenterology, Washington, D. C., May 25-31, 1958. H. M. Pollard, M.D., Secretary-General, University Hospital, Ann Arbor, Michigan.

WORLD HEALTH ASSEMBLY TO MEET IN MINNEAPOLIS

The World Health Assembly, policy-making body of the World Health Organization, will hold its tenth annual meeting in Minneapolis, May 26 to June 14, 1958. At this first meeting of the assembly in the United States, an attendance of 400 delegates is expected, representing eighty-eight nations. Total attendance is expected to be 1,500, including the secretariat staff from WHO headquarters in Geneva, a staff from the U. S. State Department, and visitors and observers.

WHO, which was founded in 1946, following signing of the United Nations charter, has gradually absorbed existing international health organizations and is now established as a permanent agency of the UN. It is dedicated to the goal of helping all people attain complete physical, mental, and social well-being. For nine years it has waged an intensive war against malaria, tuberculosis, yaws, trachoma, and leprosy. It also gives technical aid to member nations, provides training opportunities for health personnel, disseminates health information, and fosters research on diseases.

FELLOWSHIPS AVAILABLE FROM AMERICAN FOUNDATION FOR ALLERGIC DISEASES

The American Foundation for Allergic Diseases announces their post-doctoral fellowships in research and clinical allergy for two years each. The stipend for the first year is \$4,500; second year, \$4,750; laboratory and travel expenses for two-year period, \$750.

Requests for applications should be sent directly to one of the following, in whose field the candidate would like to work: Dr. Colin M. MacLeod, Professor of Research Medicine, University of Pennsylvania, 820 Maloney Clinic, 36th and Spruce Streets, Philadelphia 4, Pa.; or Dr. Herman N. Eisen, Professor of Medicine (Dermatology), Washington University School of Medicine, 600 South Kingshighway, Saint Louis 10, Missouri.

Applications should be filed no later than December 15, 1957 with any of the above.

CONTINUATION COURSES

Medical continuation courses to be presented at the Center for Continuation Study, University of Minnesota are:

December 5-7	Fractures for General Physicians
January 6-11	Ophthalmology for Specialists
January 9-11	The Newer Drugs in General Practice
Jan. 30-Feb. 1	Emergency Surgery for General Physicians

For further information concerning the above courses, write to the Director, Department of Continuation Medical Education, 1342 Mayo Memorial, University of Minnesota, Minneapolis 14, Minnesota.

NEW ORLEANS GRADUATE MEDICAL ASSEMBLY

The twenty-first annual meeting of The New Orleans Graduate Medical Assembly will be held March 3, 4, 5 and 6, 1958, with headquarters at the Roosevelt Hotel.

Eighteen outstanding guest speakers will participate, and their presentations will be of interest to both specialists and general practitioners. The program will include fifty-four informative discussions on many topics of current medical interest, in addition to clinicopathologic conferences, symposia, medical motion pictures, round-table luncheons and technical exhibits.

The Assembly has been officially approved for Category I by the Commission on Education of the American Academy of General Practice. Thirty hours of formal credit will be allowed for attendance at this meeting.

Following the meeting in New Orleans, arrangements have been made for a postclinical tour to Mexico City, Cuernavaca, Taxco and Acapulco, leaving from New Orleans on Friday, March 7, and returning on Tuesday, March 18.

Details of the New Orleans meeting and the post-clinical tour are available at the office of the Assembly, Room 103, 1430 Tulane Avenue, New Orleans 12, Louisiana.



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Woman's Auxiliary

LIFE IN FORMOSA

The following letter which will undoubtedly be of great interest both to physicians and their wives was sent in by Mrs. Peter Pankratz, formerly of Mountain Lake, Minnesota, an active member of the Southwestern Minnesota Auxiliary. She and her husband are now stationed at the General Conference Mission in Taiwan, Formosa.

I promised quite some time ago that I would write to share with you some of the "on-the-fringe-of-things" here, but the minute someone hears the "peck-peck" of my typewriter, it's the signal for callers; they can hear that I'm home so I expect this will be in the composition room for several days.

We have been here now a bit over a year and it is "home" to us; there is beauty all around us—the ocean, the mountains, the friendly people! There is beauty, too, among the sordid that comes each day to the hospital, and we think things are a bit better than when we came.

The place is much cleaner and doesn't smell as awful; could it be that we have become conditioned? Maybe so. We hope it won't be too much longer until some teaching of good health habits takes hold and goes home from the clinic with these people, who, in their villages mostly live in shelters, along with ducks and chickens, turkeys and geese, a pig or two and the water buffalo which rates better care than the children in many cases.

Having seen the dirt floors on which babies sit, bare-bottomed, and where their hands, filthy dirty from whatever they investigate by which they are surrounded, invariably find their mouths or rub their eyes or their runny noses, I can understand why they are covered with sores, why their bellies are filled with worms. Not a very pretty picture, and how hard it is to take good care of such children, nurse them to beauty and then have to let them go right back into such living conditions again only to have it happen all over again!

And some are brought in so pitifully undernourished; one such was a little two-year-old girl who looked like she was only two great big dark eyes and the rest of her so wizened that she was called "little monkey." It took a while, but she grew into a real beauty; everyone played with her and missed her when her mother took her home. And then poor care and no food and too many other troubles in the home brought her back again. Once more she became beautiful and once more we let her go home with her irresponsible mother, and several days later our nurses' aides went to see her in another hospital where they had taken her, crushed and broken, hoping that we would not find out that her mother had trampled her most to death! She died. Our broken hearts must go beyond the confines of our hospital. Someone needs to "walk with and show them the way."

Our mobile clinic unit goes to the mountain villages one week of each month. It is made up of a doctor, a nurse or nurse's aide, a dentist or dental assistant, the hospital chaplain and the driver of the vehicle, the hospital ambulance. The doctor who has been helping, calls this his "spare-time work." He and his wife, both young and dedicated, from Norway, are working full-

time running a hospital for lepers in the southern part of this island. They are such an inspiration.

We have been taking pictures and have some quite nice ones—flowers and trees and rice fields and natives in and out of their colorful attire and other things, and one, a reflection which, when it is flashed on the screen, has everyone saying "Isn't that simply beautiful?" And really it is not beautiful; it is full of maggots, mosquitoes and pollution; it is a picture of shacks and out-houses sitting on the edge of a swamp; people live there. As a photograph, it is a superb reflection, but when one considers what is reflected, it is ugly and heart-breaking, full of vermin and germs. The people who live there, alive, yes, but you wonder why and what incentive, what force keeps them alive, slumming in such squalor. And they come and want to be made well so that they can go on living. We dare ask, where is the assistant to the assistant to the assistant to the sanitation engineer who will go to the "rice-roots" so that these people can live? We do not despair; we see cupfuls of milk dispensed and with each cupful, a cup of human kindness—that will be the measure.

Which brings me back to what I had planned to say first. Thank you to Mrs. Raymond Minge (of Worthington) and her committee and to everyone who helped with that drug shipment that came to us. There was much work to collecting, sorting and preparing the samples for overseas shipment; itemizing and tabulating was done so neatly. They were allowed in duty-free, be assured. They are being used and we are most grateful for your loving kindness which helps to fill that cup!

May you have a most wonderful time meeting together; I'm thinking of each one of you.

THEO PANKRATZ

SCHOOL OF INSTRUCTION IN MINNEAPOLIS

The Woman's Auxiliary to the Minnesota State Medical Association observed its annual one-day School of Instruction, Tuesday, October 8, in the New York Room, Hotel Leamington, in Minneapolis.

Dr. Walter C. Alvarez, editor-in-chief of *Modern Medicine* and twin-city newspaper health columnist, was the featured luncheon speaker for the occasion.

Dr. H. B. Sweetser, president-elect of the Minnesota State Medical Association, presented a luncheon greeting to the group.

Mrs. Paul C. Craig, Wyomissing, Pennsylvania, national president of the Woman's Auxiliary to the American Medical Association, spoke on "Health Is a Joint Endeavor."

The following presentations were included on the School of Instruction agenda: "American Medical Education Foundation," Mrs. M. D. Starekow, Thief River Falls; "Today's Health," Mrs. H. P. VanCleve, Austin; "Legislative Concerns," Mrs. L. Raymond Scherer, Minneapolis, and Mrs. L. R. Boies, Minneapolis; "Some Safety Angles," Mrs. Ralph Olson, St. Paul, Mrs. M. F. Fellows, Duluth, Mrs. Gilman Goehrs, St. Cloud, and Mr. Joe Neal, St. Paul; "A Public Relations Problem," Mrs. M. O. Wallace, Duluth; "Hospital Costs," Mr. Russell Nye, Minneapolis; "Rehabilitation," Mrs. Conrad Karleen, Minneapolis, Mrs. Wallace P. Ritchie, St. Paul, and Mrs. H. P. VanCleve, Austin. Mrs. L. P. Howell, Rochester, was the moderator.

Contributions for this column, including news and activities of state auxiliary societies and items of interest about members, may be sent to Mrs. A. B. Rosenfield, Woman's Auxiliary Editor, MINNESOTA MEDICINE, 2920 Dean Boulevard, Minneapolis, Minnesota.

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In Memoriam

LEON C. COMBACKER

Dr. Leon C. Combacker, Fergus Falls physician for thirty years, died October 1, 1957. He was seventy-four years old.

Dr. Combacker was born in Osceola, Wisconsin, and received his preliminary education in the public schools of that community. He attended Michigan University, Ann Arbor, and received his A.B. and medical degrees from that institution. In addition, he did post-graduate work at the University of Minnesota.

His specialty was eye, nose and throat. Prior to his practice in Fergus Falls, he was located in Osceola, Wisconsin, for fourteen years and Stillwater, Minn., for one year. Dr. Combacker was a member of St. Luke's hospital staff in Fergus Falls, the American Academy of Ophthalmology and Otolaryngology, Park Region District and County Medical Society, the Minnesota State Medical Association and the American Medical Association.

Survivors include his wife, Mabel; two daughters, Catherine Hughes, Wilmington, Delaware, and Alice Olson, Zumbrota, Minnesota; four grandchildren; one brother, Howard R. Combacker, Minneapolis, Minnesota; and a sister, Mrs. G. M. Funne, Osceola, Wisconsin.

ELMER EUGENE DADY

Dr. Elmer E. Dady died September 27, 1957, at the age of seventy-two. He served as a general practitioner in Minneapolis, Minnesota, for forty-seven years. He was also a member of the staff at Deaconess Hospital in Minneapolis.

Born in Wabasha, Minnesota, Dr. Dady received his preliminary education in the public schools of that community, and his medical degree from Marquette University in Milwaukee, Wisconsin. He was a member of the Hennepin County Medical Society, and the Minnesota State Medical Association. In addition, Dr. Dady was a member of the Joppa Masonic Lodge.

His survivors include his wife, Leila; two brothers, J. F., Pomona, California, and Kenneth, Minneapolis; and three sisters, Mrs. Max Maschka and Mrs. M. Murriel Harrison, both of Minneapolis, and Mrs. Clarence W. Taylor, Bakersfield, California.

ALVIN J. KISTLER

Dr. Alvin J. Kistler, a Minneapolis physician and surgeon, died October 2, 1957. He was sixty-eight years old.

Dr. Kistler was a staff member of Swedish Hospital for more than forty years, and was a member of the Hennepin County Medical Society, Minnesota State Medical Association, American Medical Association, American College of Surgeons, International College of Surgeons, and was also on the Mount Sinai hospital staff.

Dr. Kistler was a native of Minneapolis and a mem-

ber of the Minneapolis Athletic Club and Interlachen Club. He was also a former member of the Ancker hospital staff in St. Paul. He obtained his preliminary education in Minneapolis public schools, and received his medical degree from Marquette University, Milwaukee, Wis.

Survivors include his wife, Alice; one son, Kent, Minneapolis; two sisters, Mrs. Douglas Larson, Minneapolis, and Mrs. Benjamin Greathouse, Lexington, Kentucky; and three grandchildren.

SIDNEY F. ROGERS

Dr. Sidney F. Rogers, St. Paul physician, died October 24, 1957, at the age of fifty-four.

He was a graduate of the University of Minnesota School of Medicine, class of 1932. His practice since graduation was located in the Riverview district of St. Paul.

Dr. Rogers was on the staff of Midway, Riverview and Mounds Park hospitals. In addition, he was a member of the Riverview Commercial Club, Ramsey County Medical Society, Minnesota State Medical Association, and American Medical Association.

Surviving are his wife, Gladys; two sons, Loren, with the Army in Germany, and Gary, St. Paul; one daughter, Mrs. Thomas Peterson, Rosemount; two sisters, Mrs. Clarence Bill, St. Paul, and Sister M. Dolorosa, Manakato; and two brothers, Joseph W., Costa Mesa, California and Hubert B., St. Paul.

HARRY G. WOOD

Dr. Harry G. Wood, a lung specialist at the Mayo Clinic, Rochester, died October 17, 1957, at the age of seventy-five.

He was born in Faribault, Minnesota, and graduated from Shattuck Military Academy. His medical education was obtained at McGill University, Montreal, Canada. Special work included one year of internship at Montreal General Hospital in Montreal.

Dr. Wood held the following positions and professional affiliations: association in medicine, the Mayo Clinic; assistant professor of medicine, the Mayo Foundation. He also practiced in Blooming Prairie and St. Paul.

Membership was held by Dr. Wood in the American College of Physicians, Association of Military Surgeons, American Congress of Internal Medicine, Minnesota Trudeau Society, Zumbro Valley Medical Society, Minnesota State Medical Association, American Medical Association, and Alumni Association of the Mayo Foundation. He became a member of the "Fifty Club" of the Minnesota State Medical Association in 1955.

Dr. Wood is survived by his wife, Katherine; one son, Harry G. Wood, Jr., Rochester; one daughter, Mrs. C. J. Berardini, Denver, Colorado; two grandchildren; and one sister, Mrs. A. M. Gardner, Hood River, Oregon.

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General Interest

More than 3,100 persons registered for recent mouth cancer detection tests conducted in the Willmar area. The detection team included fifteen Kandiyohi County dentists and five University of Minnesota doctor consultants. The project was sponsored jointly by the Minnesota Division of the American Cancer Society with the Minnesota State Medical Association and the Minnesota State Dental Association.

* * *

The Southern Minnesota Medical Association, at its annual meeting held September 9 at Lake City, voted to establish a student loan fund at the University of Minnesota for medical students.

* * *

Dr. Paul Giddens, president of Hamline University, has announced the appointment of Dr. Donald Roach, Roseville, as college physician. Dr. Roach received his Doctor of Medicine degree from the University of Minnesota in 1953 and has been in private practice since 1954.

* * *

Dr. Robert B. Howard has been named associate dean of the University of Minnesota Medical School to serve while University regents seek a new dean to succeed Dr. Harold S. Diehl. Dr. Diehl became senior vice-president of the American Cancer Society, New York, on November 1, but will keep the deanship on a leave basis until June. Prior to his present appointment, Dr. Howard has been associate professor of medicine and director of continuation medical education at the University of Minnesota. Dr. N. L. Gault has been assigned that job.

* * *

Dr. R. L. Erickson, is currently in the process of establishing a new practice in Rosemount. Dr. Erickson has previously practiced in Lanesboro, Minnesota, and most recently Laurel, Maryland.

* * *

Dr. Robert P. Bush, St. Paul, has been named psychiatric consultant to Family Service, a Community Chest casework agency.

* * *

Dr. Leo R. Prins has been elected new president of the Southern Minnesota Medical Association. He succeeds Dr. C. F. Stroebel, Rochester. Other officers include Dr. William O. Finkelnburg, Winona, first vice-president; Dr. C. Covell Bailey, Lake City, second vice-president; Dr. G. R. Diessner, Rochester, re-elected secretary-treasurer.

* * *

Dr. Dana W. Atchley, professor of clinical medicine, Columbia University, College of Physicians and Surgeons, was the principal speaker at the annual Minnesota Medical Foundation Day at the University of Minnesota. "The Physician As Scholar and Humanist" was the topic of his address. During the observance, 24 medical students at the University received scholarships

totaling \$12,250 from contributions of physicians, medical organizations, corporations and individuals.

* * *

Dr. Henry W. Meyerding, Rochester, president-elect of the International College of Surgeons, presided at the 22nd annual congress of surgeons of the United States and Canada held recently in Chicago.

* * *

Three Rochester surgeons were recently selected as honorary fellows of the International College of Surgeons. Included are two Mayo Foundation professors of surgery, Dr. Virgil S. Counsellor and Dr. Frederick A. Figi, and one emeritus professor of surgery, Dr. Claude F. Dixon.

* * *

Dr. Andre J. Bruwer, a specialist in diagnostic roentgenology and a member of the staff of the Mayo Clinic since 1952, has left Rochester to continue the practice of his specialty in Tucson, Arizona.

* * *

A new medical clinic is under construction in Hutchinson as a result of the joint efforts of four Hutchinson doctors. Participating in the project are Drs. Carl Bretzke, Dan Huebert, George R. Smith and Kenneth Peterson. The new clinic, a one-story brick structure, has been designed so that each physician can continue his own private medical practice, but at the same time can call upon other physicians in the clinic for assistance when necessary. Completion of the clinic for occupancy is expected for about January 1, 1958.

* * *

Dr. Henry W. Woltman, Rochester, received the University of Minnesota's outstanding achievement award recently at Minnesota Medical Foundation Day ceremonies held in the Mayo Memorial Auditorium on the Minneapolis campus, University of Minnesota. Dr. Woltman served as head of the neurology section at the Mayo Clinic and neurology professor in the Mayo Foundation, Rochester, until his recent retirement.

* * *

Dr. Robert D. Pilgrim, Benson's physician, has located in Ramona, California, where he will continue his general practice.

* * *

Post-Graduate Medicine, of which Dr. Charles W. Mayo is editor-in-chief, was one of four United States medical periodicals to be awarded the 1957 Honor awards for Distinguished Service in Medical Journalism by the American Medical Writers Association. The awards are presented annually for "accuracy, clarity, conciseness and newness of information in articles, editorials and other material, for excellence of design, printing and illustrations, and for distinguished services to the medical profession."

(Continued on Page A-54)



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(Continued from Page A-52)

Dr. Bayard T. Horton, a member of the Mayo Clinic since 1929, will retire January 1, 1958.

* * *

Five new consultants and eight assistants have been named to the staff of the Mayo Clinic. The consultants are: **Drs. Leonard A. Aaro**, obstetrics and gynecology; **Robert E. Lee**, therapeutic radiology; **Emerson A. Moffitt**, anesthesiology; **John T. Shepherd**, physiology, and **William H. Weidman**, pediatrics. Assistants appointed to the staff are: **Drs. Matthew H. Bulluck**, **Allan Gould, Jr.**, **Horace Ivy**, **Charles G. Moertel**, **Paschal A. Sciarra**, **Gunnar B. Stickler**, **Welby N. Tauxe**, and **John W. Rosevear**.

* * *

Dr. C. E. Sisler, a Grand Rapids physician for thirty-five years, has accepted a position on the staff of the student health service of the University of Minnesota, Minneapolis.

* * *

Dr. R. W. Taintor has joined the staff of the Marshall Medical Center as practicing physician.

* * *

Dr. David T. Carr, consultant in medicine in the Mayo Clinic, is one of three members of a new team which will conduct research in the constant-observation unit now being constructed by the Rochester Methodist Hospital. Dr. Carr is chairman of the medical investigation unit which will direct the research in the new structure.



Dr. Leroy J. Larson, Bagley physician for thirty-two years was recently honored by 500 persons of that community. Former associates and civic leaders paid tribute to Dr. Larson at a special program held in the Bagley High School Auditorium. Dr. Larson was cited for his excellent medical service and civic leadership.

* * *

Construction of a new medical center to be known as the Professional Building has begun at 175 East Lake St. in Wayzata. Sponsors of the project are **Dr. W. W. Rieke** and **Dr. D. W. Feigal**, both of Wayzata. Also a member of this group is dentist, **Dr. Jack Anderson** of Long Lake.

* * *

Dr. J. V. Carlson, Westbrook, was recently honored for twenty-five years of service to that community.

* * *

Dr. James F. Weir, Mayo Clinic, Rochester, was elected president of the Mayo Alumni Association at the final business meeting of that group held recently in Rochester. Other new officers are: **Dr. George A. Lord**, Hanover, N. H., first vice president; **Dr. Lee Clark**, Houston, Texas, second vice president, and **Dr. Howard Andersen** of the Clinic, secretary-treasurer.

(Continued on Page A-56)

ANNOUNCING

The Twenty-First Annual Meeting of The New Orleans Graduate Medical Assembly

Conference Headquarters – Roosevelt Hotel

March 3, 4, 5, 6, 1958

GUEST SPEAKERS

Carleton B. Chapman, M.D., Dallas, Tex.
Cardiology
Herbert Rattner, M.D., Chicago, Ill.
Dermatology
Charles A. Flood, M.D., New York, N. Y.
Gen. Int.
Robert A. Davison, M.D., Memphis, Tenn.
General Practice
Lawrence M. Randall, M.D., Rochester, Minn.
Gynecology
Bayard T. Horton, M.D., Rochester, Minn.
Internal Medicine
Perrin H. Long, M.D., Brooklyn, N. Y.
Internal Medicine
George N. Raines, Capt., MC, USN, Washington, D. C.
Neuropsychiatry
Robert H. Barter, M.D., Washington, D. C.
Obstetrics

Ralph O. Rychener, M.D., Memphis, Tenn.
Ophthalmology
C. Leslie Mitchell, M.D., Detroit, Mich.
Orthopedic Surgery
Frank D. Lathrop, M.D., Boston, Mass.
Otolaryngology
Arthur H. Wells, M.D., Duluth, Minn.
Pathology
James Marvin Baty, M.D., Boston, Mass.
Pediatrics
Harold O. Peterson, M.D., Minneapolis, Minn.
Radiology
Jere W. Lord, Jr., M.D., New York, N. Y.
Surgery
Claude E. Welch, M.D., Boston, Mass.
Surgery
Ormond S. Culp, M.D., Rochester, Minn.
Urology

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(Continued from Page A-54)

The 1957 Scientific Products Foundation Award of the College of American Pathologists was awarded at the annual meeting of the College in New Orleans, Louisiana, October 1, to **Dr. James W. Kernohan**, chairman of the Sections of Pathology of the Mayo Clinic and Professor of Pathology in the Mayo Foundation.

* * *

Dr. C. F. Dixon, who retired from the Mayo Clinic July 1, recently returned from a nine-week trip to Europe where he visited hospitals and clinics in London, Spain, Lisbon, Portugal, Zurich, Berne and Geneva, Switzerland; the International Hospital in Rome and American and French hospitals in France to observe surgical procedures and to attend medical meetings.

* * *

The East Range Clinics, which maintain clinics in Virginia, Eveleth, Biwabik, Aurora and Hoyt Lakes, Minnesota, have recently completed a major remodeling and expansion of the Virginia clinic. The East Range staff of twenty includes: **Drs. R. W. Anderson, R. E. Barnes, S. C. Blackmore, J. L. Bonner, J. R. Chittum, J. A. Malmstrom, R. E. Student and N. W. Hoover** in general practice; **Dr. George B. Ewens** in dermatology; **Dr. M. T. Summar** in ear, nose and throat; **Drs. Mc-Lemore Bouchelle, F. R. Kotchevar, and W. Woodruff** in general surgery; **Drs. Paul Reed, D. J. Richter, and M. J. Weir** in internal medicine; **Drs. A. M. Antonow**

and **L. K. McGill** in obstetrics-gynecology; **Dr. R. E. Payne** in pediatrics; and **Dr. I. M. Prlina** in urology.

* * *

Dr. George E. Rice presided at the recent 33rd annual meeting at Rochester of the Alumni Association of the Mayo Foundation, of which he is outgoing president. **Dr. Rice**, who is attending surgeon at the Parkview Hospital and visiting surgeon at St. Mary's Hospital in Pueblo, Colorado, where he has his own surgical practice in the Pueblo Clinic, was a fellow in surgery of the Mayo Foundation in 1919.

* * *

A well-known Mayo Clinic surgeon, **Dr. Virgil S. Counsellor**, who will retire from the Clinic staff this year, was honored at a dinner meeting during the reunion of the Alumni Association of the Mayo Foundation in Rochester recently. About twenty-nine of **Dr. Counsellor's** former first assistants attended, including **Dr. Deward O. Ferris**, now a Clinic surgeon, who was chairman of the dinner.

* * *

Dr. R. W. Gifford, Jr., of the Mayo Clinic in Rochester, spoke on the causes and modern treatment of thromboembolism at a recent meeting of the Southwestern Minnesota Medical Society in Worthington, Minnesota. The group, which met at the home of **Dr. and Mrs. M. W. Plucker** of Worthington, also heard reports on the World Health Organization from **Mrs. H. A. Christian-**

(Continued on Page A-58)

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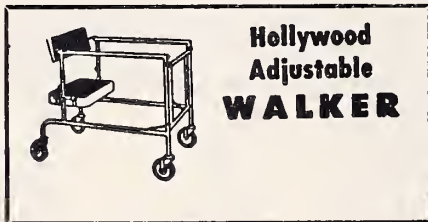
(Continued from Page A-56)



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son, auxiliary president, and Mrs. W. B. Wells, both of Jackson, Minnesota. The group also discussed sending medicine and vitamins to national and foreign missions.

* * *

Dr. Laurentius O. Underdahl conducted a Metabolic Conference at the recent 33rd Annual Meeting of the Alumni Association of the Mayo Foundation. Dr. Lawrence M. Randall opened the Obstetric and Gynecologic scientific sessions at St. Mary's Hospital for the Rochester meetings.

* * *

Effective December 1, 1957, Dr. Ezra V. Bridge has resigned as medical director and superintendent of the Mineral Springs Sanatorium, Cannon Falls. Dr. Bridge, who came to the institution in 1951, will enter private practice in Port Huron, Michigan.

* * *

At the twenty-second annual Congress of the United States and Canadian sections of the International College of Surgeons, held in Chicago, September 12-16, Dr. I. L. Oliver, Graceville, was made a Fellow of the International College of Surgeons.

* * *

Dr. William H. Feldman has resigned, effective January, 1958, as a member of the staff of the Mayo Foundation and Clinic to become Chief of Laboratory Research in Pulmonary Diseases in the Department of Medicine and Surgery of the Central Office Staff of the Veterans Administration in Washington, D. C. Dr. Feldman came to Rochester in 1927 as an instructor in comparative pathology in the Mayo Foundation, and in 1952 and 1953 was president of the American Association of Pathologists and Bacteriologists.

* * *

Dr. Arthur C. Kerkhof, community services chairman of the Minnesota Heart Association, moderated a panel on employment of the cardiac industry at a recent meeting of the National Rehabilitation Association in Minneapolis.

* * *

Drs. C. C. Brown and W. H. Goodnow of the Duluth Clinic staff, have been elected members of the Minnesota Society for the Study of Diseases of the Heart and Circulation.

* * *

Dr. Ralph Nyhus, of the Mesaba Clinic in Hibbing, will assume the duties of health director for the school district, village and town of Stuntz during Health Director George Erickson's leave of absence. Dr. Erickson is taking advanced work in public health.

* * *

St. Clair, Minnesota, is looking for a doctor and dentist to practice in its medical building constructed three years ago. Since Dr. J. C. Wohlrabe removed his practice to Mankato last August, St. Clair, a town of about 400 people, is dependent upon Mankato or Janesville for medical care.

(Continued on Page A-60)

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(Continued from Page A-58)

Dr. William L. Estes, Jr., of Bethlehem, Pennsylvania, president-elect of the American College of Surgeons, delivered the Judd-Plummer Memorial Lecture, "Inguinal Hernia and Its Treatment," at the recent meetings of the Alumni Association of the Mayo Foundation. Recipients of awards presented at the meetings were Dr. Irwin J. Fox for meritorious research; Dr. John C. Turner, who received the Howard K. Gay Memorial Fund, and Dr. Harry N. Hoffman, II, who received the Postgraduate Medical Travel Award.

* * *

Dr. Ralph K. Ghormley, head of the Section of Orthopedic Surgery in the Mayo Clinic from 1947 to 1955 and professor of orthopedic surgery in the Mayo Foundation, was honored at a gathering of his colleagues and former fellows in Rochester recently. A traveling education scholarship to be awarded to fellows in orthopedic surgery of the Mayo Foundation was established and named in honor of Dr. Ghormley. Dr. Ghormley is a past president of the American Orthopedic Association, the Clinical Orthopedic Society and the American Board of Orthopedic Surgery, and a consultant in orthopedic surgery to the Veterans' Administration in Washington, D. C. Dr. H. H. Young, chairman of the Sections of Orthopedic Surgery in the Mayo Clinic, was master of ceremonies for the occasion and Dr. E. W. Johnson, Consultant in Orthopedic Surgery in the Mayo Clinic, was chairman of arrangements. Speakers included Dr. Frank S. Babb, clinical instructor in surgery in the University of Minnesota Medical School and Dr. Edward H. Henderson, who described his experiences in England as an exchange graduate fellow in orthopedic surgery.

* * *

Dr. T. G. Murn has left the Mesaba Clinic in Chisholm, Minnesota, to enter practice in St. Cloud.

* * *

Former fellows and staff members of the Mayo Foundation in Rochester, Minnesota, honored Dr. William F. Braasch, urologist, recently. An oil portrait of Dr. Braasch was presented to Dr. C. W. Mayo of Mayo Clinic and Mayo Foundation. Dr. Braasch, a past president of the American Urological Association and of the Clinical Society of Genito-Urinary Surgeons, a founder of the American Board of Urology in 1934, an acting director of the Mayo Foundation and member of Mayo's Board of Governors, was retired from the Clinic in 1946. Since that time he has been consulting physician of the Olmsted Community Hospital. Dr. John L. Emmett of the Section of Urology of the Mayo Clinic, was chairman of arrangements and Dr. C. D. Creevy, head of the department of Urology of the University of Minnesota Medical School, was general chairman of the ceremonies. Among speakers were Dr. Gilbert J. Thomas, Santa Monica, California; Dr. Russell M. Wilder, emeritus member of the Mayo Clinic staff; Dr. A. Miles Griffin of Oakland, California; Dr. Charles C. Higgins of the Cleveland Clinic; Dr. William



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(Continued from Page A-61)

of the Interstate Postgraduate Medical Association of North America, in Chicago, September 28 to October 3. Drs. Edward H. Rynearson, Waltman Walters, and George A. Hallenbeck of the Mayo Foundation Graduate School, Minneapolis, also participated in the program.

* * *

At a meeting of the Southwestern Minnesota Medical Society held in Worthington, September 16, Dr. Lucian Smith, department of medicine, Mayo Clinic, Rochester, was the guest speaker. His subject was "Pain Patterns and Treatment in Peptic Ulceration of the Esophagus, Stomach and Duodenum." The Society's Woman's Auxiliary, meeting at the same time, had as its speakers Mrs. C. L. Oppegaard of Crookston, president of the Woman's Auxiliary to the Minnesota State Medical Association.

* * *

Hypertension was the subject of the final meeting of the three-day Minnesota Heart Association biennial conference in Rochester recently, cosponsored by the Mayo Foundation. Dr. John F. Briggs, clinical associate professor of medicine at the University of Minnesota, and Dr. Joseph M. Janes, of the Mayo Clinic, led the case history discussions. Drs. Walter F. Kvale, William Manger and Grace M. Roth, all of the Mayo Clinic, made a joint presentation on pheochromocytoma. Drs. Manger and Roth are credited with originally working out the laboratory techniques which identify the tumor of the adrenal gland. Other speakers at the Heart Conference included Dr. Maurice Visscher, head of the Physiology Department at the University of Minnesota, and Dr. Edgar V. Allen of the Mayo Clinic and president of the American Heart Association, who talked on "Evaluation of Results of Treatment in Peripheral Vascular Disease."

* * *

Dr. Edgar V. Allen, internist of the Mayo Clinic and professor of medicine in the Mayo Foundation, presented the annual Howard W. Blakeslee Awards for excellence of presentation of popular accounts in the general field of cardiovascular diseases at a recent meeting of the executive committee of the board of directors of the American Heart Association in New York City. Dr. Allen is president of the association.

* * *

At the annual meeting of the Southern Minnesota Medical Association meeting at Lake City, September 9, Dr. R. W. Kearney, Mankato, won the medal for the best case presentation, and Dr. Mary Giffin, Rochester, was awarded the medal for the best presentation of a medical subject.

* * *

At the International Congress of Ultrasound in Medicine, held in Los Angeles, during early September, Drs. E. J. Baldes and Frank Krusen presented papers. Dr. Baldes' paper, written in association with Drs. J. F. Herrick and Charles Stroebel, was entitled "Biologic Effects of Ultrasound." The paper on "The Therapeutic Application of Ultrasound in Physical Medicine" was prepared jointly by Dr. Krusen and Dr. J. F. Lehmann, now of the University of Washington.

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GENERAL INTEREST

Four members of the Mayo Clinic staff, who have recently retired from active service in the Clinic, are: **Dr. Frederick A. Figi**, plastic surgeon and a member of the staff for thirty-four years; **Dr. Eugene T. Leddy**, consultant in therapeutic radiology and a member of the staff for thirty-two years; **Dr. Richard M. Hewitt**, Associate Professor in Medical Literature and head of the Section of Publications and a Clinic staff member twenty-nine years; and **Chester G. Roesler**, insurance manager for the Mayo Clinic and a staff member for forty years.

* * *

Dr. A. C. Hilding, of the Research Laboratory, St. Luke's Hospital in Duluth, Minnesota, presented a two-hour course on "Physiology of Hearing as Related to Hearing Loss and Its Therapy," for the Home Study Program of the American Academy of Ophthalmology and Otolaryngology at the group's recent meeting in Chicago. Dr. Hilding also recently gave the third annual E. T. Bell lecture of the Minnesota State

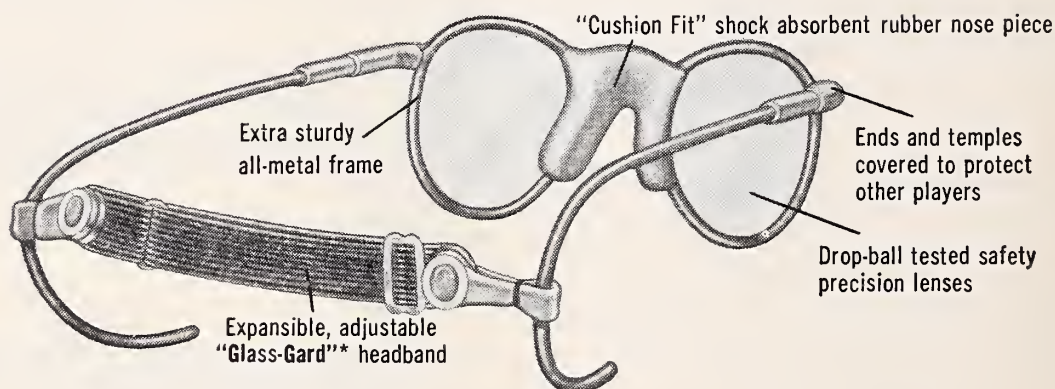
Pathologists's Society at the Mayo Memorial Building in Minneapolis on the subject, "Some Aspects of the Physiopathology of the Tracheobronchial Tree." He also presented data on "Localization of Contaminant of the Tracheobronchial Tree" at the American Cancer Society Lung Cancer Research Workshop at Virginia Beach, Virginia.

* * *

Three Veterans Administration area medical offices will be moved as part of a geographical realignment of VA medical areas to provide more efficient administration. When space can be obtained and adequate notice can be given to personnel, the Columbus, Ohio office will be moved to Indianapolis, Indiana, and the St. Paul, Minnesota, office will be moved to Omaha, Nebraska, and the St. Louis office will be moved to Dallas, Texas. Approximately twenty-eight persons are employed in each of the three offices, which supervise VA medical programs in multistate areas. In realignment of areas, jurisdiction for the upper peninsula of

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GENERAL INTEREST

Michigan and the state of Wisconsin and Illinois will be transferred from the St. Paul area medical office to the Indianapolis area medical office. The realignment is to equalize the work load among the area medical offices.

* * *

The following Minnesota physicians were recently inducted as new fellows of the American College of Surgeons: Drs. Noel E. Tosseland, Duluth; Burtan A. Orr, Faribault; Stuart W. Arhelger, Eugene F. Bolliger, Lester W. Carlender, Claude R. Hitchcock, Yoshio Sako and Bernard J. Spencer, Minneapolis; Philip E. Bernath, Kenneth D. Devine, James H. DeWeerd, James S. Hunter, Jr., and Dwight C. McGoon, Rochester; Sam Wynne Hunter, St. Paul, and McLemore Bouchelle, Virginia.

* * *

Dr. O. G. McDonald has been elected president of the Minnesota Surgical Society.

* * *

Dr. R. T. Brown, who has been associated with Dr. A. J. Lenarz in the practice of medicine and surgery at Browerville since last April, has decided to continue the association and practice in that community.

* * *

The Minnesota division of the American Cancer Society on September 27 approved allocations of \$150,000 in grants for cancer research in Minnesota.

* * *

Physicians recently elected to the board of directors of the Minnesota section of the American Cancer Society include Drs. Lyle A. Tongen, St. Paul; Leonard

A. Lang, Minneapolis; D. J. Nollet, Hibbing; and Philip F. Eckman, Duluth. Drs. David G. Becker, Rochester, and D. G. Uhley, Crookston, were re-elected to the board.

* * *

For the new quarter which began October 1, 1957, forty-five new fellows began advanced studies at the Mayo Clinic. Thirteen of the forty-five fellows are from foreign countries—Canada, Australia, New Zealand, England, and Colombia.

* * *

Dr. Gordon R. Kamman, St. Paul, and Mr. Charles Murnane, a St. Paul attorney, addressed the Winona County Medical and Bar Associations at Winona, Minnesota, on Monday, September 23. Their topic was "Medico-Legal Problems." A similar address was given by Dr. Kamman and Mr. Murnane, September 20, at Mankato, Minnesota, at a meeting of the Blue Earth County Medical and Bar Association. Dr. Kamman also addressed the Southwestern Minnesota Medical Society, in Worthington, October 14, on "How to Diagnose a Depression."

* * *

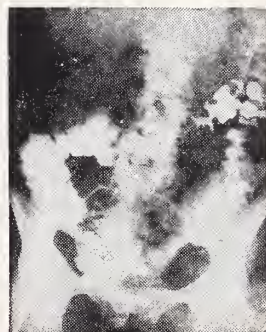
The fourth biennial symposium on "Peripheral Vascular Disease," presented by the Minnesota State Heart Association and the Mayo Foundation, was held at Rochester, September 23. About 150 physicians attended.

* * *

Dr. A. J. Lenarz, Browerville, suffered a heart attack, September 11, and was a patient at St. John's Hospital in that city for some time.

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GENERAL INTEREST

Dr. F. M. Jolin, who began practice in Grand Rapids, Minnesota, in 1931, has disposed of his business interest in the Grand Rapids Clinic so that he may spend more time with his family and pursue his hobbies. His associates, Drs. M. J. McKenna, M. J. Schirber, Vernon D. Erickson, and Calvin Johnson, have purchased his interest in the clinic.

* * *

Dr. R. W. Miller of the Interstate Clinic, Red Wing, Minnesota, has been appointed city health officer of that city last August to succeed Dr. G. C. Kimmel, who resigned.

* * *

Dr. Edgar V. Allen, of the Mayo Clinic and Mayo Foundation and president of the American Heart Association, made a trip to new York in September to arrange with the National Broadcasting Company for a series of nationwide television programs to be presented by that network as a public service, in co-operation with the American Heart Association.

* * *

Dr. Arrah B. Evarts, retired physician and charter member of the Rochester Business and Professional Women's Club, was honored September 22 by that group as the "Woman of the Year." From 1918 to 1937 Dr. Evarts had charge of the women's work at the Rochester State Hospital.

* * *

Drs. V. S. Counsellor, L. M. Randall, and R. B. Wilson, of the Mayo Clinic, attended the September meeting of the American Association of Obstetricians

and Gynecologists held at Hot Springs, Virginia. While in the East, Dr. Wilson also attended the Atlantic City meeting of the American College of Surgeons.

* * *

After presenting a paper at the congress of the International Society of Orthopedic Surgeons, September 16-21, Dr. P. R. Lipscomb lectured in London and visited medical centers in London, Rome, Florence, Innsbruck, Antwerp, and Edinburgh, in addition to traveling in France and Switzerland. Mrs. Lipscomb accompanied her husband on this combined business and pleasure trip.

* * *

Newly elected officers of the Northern Minnesota Medical Association, chosen at the annual two-day meeting of that group in Hibbing, September 6-7, are: Dr. Arnold Larson, Detroit Lakes, president; and Dr. Ralph Eckman, Duluth, vice president; and Dr. C. L. Oppegaard, Crookston, secretary-treasurer.

* * *

Dr. Clare Gates, director of health and medical care division of the Community Welfare Council of Hennepin County, was elected president of the Minnesota Public Health Conference at its annual meeting, September 19 and 20. Dr. Stewart C. Thompson, Minneapolis, was re-elected treasurer; and Dr. Dean S. Fleming, Minneapolis, was re-elected secretary.

* * *

Dr. Henry J. Vogl is the new manager of the Minneapolis Veterans Administration Hospital. Dr. Vogl was formerly director of professional services at the VA center in Milwaukee, Wisconsin.

* * *

At the recent annual midwest meeting of the American College of Physicians in Urbana, Illinois, Dr. Wm. B. Martin, Duluth, presented a paper on "The Significance of Diagnostic Gestures in the Pain of Coronary Insufficiency."

* * *

Dr. Jesse Douglas has taken over the duties of resident physician at Stillwater prison, succeeding Dr. Thomas Johnson who resigned to enter private practice in Minneapolis.



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Minnesota Blue Shield payments to doctors during the first eight months of 1957 exceeded by more than \$1,000,000 the amount paid for physicians' services rendered participant subscribers during the first eight months of 1956. From January through August, 1957, subscriber benefits paid by Blue Shield amounted to \$5,689,482, a monthly average of over \$711,000. The total amount paid by Blue Shield during the first eight months in 1957 is more than 24 per cent more than the amount, \$4,579,937 paid during the same eight months in 1956 for medical-surgical-obstetrical services rendered participant subscribers.

Physicians' services for which Blue Shield paid benefits also increased more than 24 per cent during the first eight months of 1957 compared to the same period in 1956. During the first eight months of 1957, Blue Shield provided benefits for 205,143 doctors' services rendered participant subscribers, or 41,445 more than the number of doctors' services for which Blue Shield benefits were paid in the same period of 1956.

Blue Shield participant subscribers numbered 858,373 as of August 31, 1957, or 71,578 more than the number of participant subscribers enrolled as of the same date in 1956. As of this date in 1956, the number of Blue Shield participant subscribers was 786,795.

Hospital care expense incurred by 135,935 Minnesota Blue Cross participant subscribers during the first eight months of 1957 exceeded \$18,700,000, an increase of nearly \$3,300,000 over hospital care costs incurred by

121,608 participant subscribers during the same period of the previous year.


Days of care provided during the first eight months of 1957 totaled 817,238.4 days compared with 739,601.0 days of hospital care provided during the first eight months of 1956.

Analyzing all Blue Cross cases paid year to date, 1957 the leading cause of hospitalization in number of subscribers hospitalized was accident cases—22,704 cases representing 16.7 per cent of total cases paid. Dollarwise, however, hospital cases due to illnesses of the digestive system ranks first in importance—approximately \$3,300,000, or 17.7 per cent of all benefits provided. Obstetrical care ranks second in both number of hospital cases paid and amount of benefits provided—21,448 cases, or 15.8 per cent of total cases paid and over \$2,700,000 hospital care costs, or 14.8 per cent of total expense incurred.

It is interesting to note that during the first quarter of 1957, illnesses of the respiratory system outranked all other reasons for hospitalization; however, during the next five successive months the number of accidents was the leading reason for hospitalization. During the months of July and August, accident cases represented 20.1 per cent and 21.4 per cent respectively of the total cases paid.

Blue Cross membership in Minnesota totals 1,128,639 persons as of August 31, 1957, an increase of 60,657 participant subscribers or 5.4 per cent since August 31, 1956.

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Prophepyridamine Maleate	12.5 mg.
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Book Reviews

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TUBERCULOSIS: EVERY PHYSICIAN'S PROBLEM. J. Arthur Myers, M.D., Professor of Internal Medicine and Public Health, Medical and Graduate Schools, University of Minnesota, Minneapolis, Minnesota. 290 pages. Illus. Price \$7.50, cloth. Springfield, Illinois: Charles C Thomas, 1957.

PERATIVE OBSTETRICS. R. Gordon Douglas, M.D., Professor of Obstetrics and Gynecology, Cornell University Medical College; Obstetrician and Gynecologist-in-Chief, the New York Hospital; Director of the New York Lying-in-Hospital; and William B. Stromme, M.D., Attending Obstetrician and Gynecologist, Northwestern Hospital and Fairview Hospital, Minneapolis; formerly Instructor in Obstetrics and Gynecology, Cornell University Medical College; Assistant Attending Obstetrician and Gynecologist, the New York Hospital. 735 pages. Illus. Price \$20.00, cloth. New York: Appleton-Century-Crofts, Inc., 1957.

PRACTICAL GYNECOLOGY. Walter J. Reich, M.D., F.A.C.S., F.I.C.S., and Mitchell J. Nechtow, M.D., F.A.C.S., F.I.C.S. Ed. 2. 648 pages. Illus. Price. \$12.50. Philadelphia: J. B. Lippincott Co., 1957.

Practical Gynecology was written principally for use by the general practitioner in the office practice of gynecology. The book fills this role; the term "practical" in the title is well carried out throughout the text. The discussion is somewhat informal, and the authors have drawn on their long experience to quote illustrative cases.

The second edition has been revised to consider new concepts and current practices in gynecology. New chapters have been added to cover Pediatric Gynecology, Radiation Therapy, Geriatric Gynecology, and the Male Role in Gynecology. A useful chapter on Psychosomatics of Gynecology is included.

Treatment is discussed from a practical standpoint, utilizing the methods the authors have found best in practice. Consideration of alternative methods is quite limited. The book will be of use to the general practitioner without specialized training in Gynecology. It will be especially valuable to the younger physicians in their early years of practice.

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Suppression and Absence of Enzyme Activity
as a Cause of Disease

VICTOR A. NAJJAR, M.D.
Baltimore, Maryland

IN ALL probability, most if not all diseases associated with disorders of metabolism, showing a definite or possible genetic background, are due to the absence or suppression of at least one enzyme system.

The essential lesion may be due to a complete absence of an enzyme with a consequent lack of the special function ordinarily ascribed to that particular enzyme. It can also be due to the presence of an incomplete enzyme protein that lacks activity for one or more reasons. The latter has not been looked for in mammalian disease. It has been encountered in mutants of neurospora.¹

The absence of function resulting from the lack of a certain enzyme activity may have serious consequences to the fertilized egg, the growing embryo or to the well developed fetus, as the case may be, depending on what level of development a particular enzyme is ordinarily formed. Under the circumstances, a viable fetus cannot result. On the other hand, if the enzyme is not of the type that is absolutely essential for the development of the organism or for the maintenance of life, then a child is born with some metabolic defect. This defect may not cause demonstrable disease, as in essential glucosuria pentosuria, and fructosuria or it may well do so, as in galactosuria (galactosemia), glycogen storage disease, phenylketonuria, et cetera.

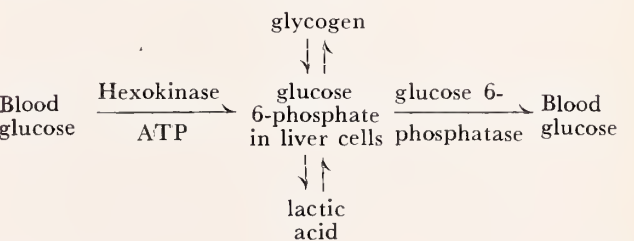
In such instances, the cause of the disease may fall into one of three categories:

- 1. It may simply be a direct result of the absence of the enzyme in question.
- 2. It may be only due to the toxic products that accumulate consequent to the absence of that enzyme. In this instance, the enzyme is deemed nonessential in that it does not play a role in major pathways of metabolism or in the activation of essential metabolites.
- 3. There can also be a combination of both factors. Here the enzyme, though not essential for life nevertheless, is essential for some major pathway of metabolism and the products that accumulate, as a result of its absence, are toxic to the organism.

There are examples in pediatrics, I believe, that fall within the scope of all three of these categories and it is this type of metabolic disorder which is the subject of this discussion.

Metabolic Diseases with Manifestations Directly
Attributable to the Absence of Enzymes

The most classical example of this type of disease is the type of glycogen storage disease in which there is absence of a specific glucose 6-phosphatase.²⁻⁵ Here the whole symptomatology of the disease can readily be deduced from this simple fact.⁶⁻⁷ One should, however, be acquainted with the function of this enzyme in relation to the steps involved in the enzyme in relation to phosphorylation into glucose 6-phosphate and its conversion to glycogen or lactic acid. In the liver, the main events governing the fate of blood glucose are as follows:



Third Irvine McQuarrie Lecture given under the sponsorship of the Department of Pediatrics, University of Minnesota, September 25, 1957.
From the Department of Pediatrics, Johns Hopkins University School of Medicine and Harriet Lane Home, Johns Hopkins Hospital, Baltimore, Maryland.
At the time this lecture was prepared, Dr. Najjar was Associate Professor at Johns Hopkins University School of Medicine. His present address is Department of Microbiology, Vanderbilt University, School of Medicine, Nashville, Tennessee.

Blood glucose is taken up by liver cells, and converted to glucose 6-phosphate by hexokinase, using the terminal phosphate of ATP (adenosinetriphosphate). This glucose 6-phosphate can be converted to glycogen or to lactic acid through a series of steps that we need not develop here. When blood glucose is high, as after a meal, most of the glucose that enters liver cells is stored as glycogen. There is a purpose in this particular function of the liver in that the stored glycogen can then be mobilized into blood glucose again. This occurs when there is a general need for glucose by other tissues. The organ that is constantly in need of blood glucose is the brain. Other tissues, unlike brain tissue, have a good reserve of glycogen stores. The maintenance of a normal blood glucose level however, remains the sole responsibility of the liver. No other tissue can substitute for this liver function. To do this, the liver has the specific glucose 6-phosphatase that hydrolyses glucose 6-phosphate to release free glucose into the blood stream. Muscle tissue with its total large stores of glycogen possesses no such enzyme and cannot therefore, furnish any substantial amount of glucose to the blood. In response to a glucose need, liver glycogen breaks down to glucose 6-phosphate which in turn is acted upon by the specific phosphatase to replenish blood glucose. In the liver the enzyme is present only in the cytoplasm of hepatic cells. In the kidney it is localized only in the proximal convoluted tubules and the glomerular endothelium.

In the absence of this enzyme, this function is erased from the physiologic pattern of balance and homeostasis. The overall picture, in simple terms, resolves itself into an ability to store glycogen from blood glucose but an inability to transform glycogen to blood glucose. Glycogen can only break down to lactic acid; a requirement that is only minute compared to the requirement for blood glucose.

A patient lacking this enzyme would, by reason of this one difficulty, develop all the manifestations associated with the classical von Gierke's disease. There is accumulation of glycogen in liver cells, much above the normal range. The individual cells appear large and engorged with glycogen. The whole liver becomes enlarged as a result. Blood glucose values drop to subnormal levels between meals. This is particularly pronounced during the overnight fast. Ketone bodies

appear in the urine, a result of incomplete oxidation of fatty acids.^{4,5} Adrenaline which stimulates the breakdown of glycogen through the phosphorylase system, cannot effect the normal rise in blood glucose because that pathway is blocked by the absence of the enzyme. Furthermore, the patient would seem to be in a continuous state of glucose starvation, a state which can readily explain the prolonged starvation type of glucose tolerance curve obtained in these patients.

Since this type of patient suffers only because of the attending hypoglycemia, it is to be expected that most if not all manifestations can be alleviated by correcting the hypoglycemia. This is done by frequent feedings along with a high protein diet. This has proved highly effective in one such individual⁸ who subsequently showed complete recovery.⁶ The recovery coincided with the onset of puberty.

It should be pointed out here that this type of glycogen storage produces no abnormality in the structure of glycogen by contrast to other types. The abnormality of the glucose 6-phosphatase is the only one observed and involves both liver and kidney tissue. There is a second and very similar type of glycogen storage disease in which the glycogen is also normal and the specific phosphatase is unimpaired. Glycogen storage here is generalized in all tissues, especially in the cardiac and skeletal muscles. The latter type is to be distinguished from a third and a fourth type where the glycogen is of abnormal structure. In one instance the glycogen is much more highly branched and in the other it is much less branched than normal glycogen. The specific glucose 6-phosphatase, in each of the latter types, is normal. The deficiency lies in the brancher or the debrancher enzymes.^{3,10} This will be discussed under the appropriate section below.

Another illustration of a disease caused by the absence of enzymes is the commonly encountered fibrocystic disease (mucoviscidosis). The precipitating cause is not known, yet the fibrotic changes in the pancreas that occur in the antenatal and postnatal periods result in deficiency if not total absence of the pancreatic enzymes. This disease is no less representative of this class than glycogen storage disease. It does lack a certain measure of glamor because it is not a clean-cut absence of one single enzyme. Nevertheless, it represents in every respect a disease in which most manifesta-

tions can be deduced from the knowledge of the function of the enzymes involved.

Meconium ileus is caused by the failure to liquefy the thick mucilagenous meconium plugs, due to the absence of the pancreatic enzymes.¹¹ The loss of proteins through the stools, because of the lack of proteolytic digestion, results in poor growth and poor musculature. The poor absorption of fat, and carbohydrates also due to the lack of splitting, because of the absence of the lipase and amylase enzymes, results in a chronic state of semistarvation.¹² As a direct result of this, one finds the large ravenous appetite. Fat soluble vitamins remain held in the fatty stools and little is absorbed. Vitamin deficiencies of the A and D types result whether outwardly manifested or not. Fatty stools also hold a lot of calcium as insoluble soaps. The loss of calcium absorption is responsible for osteoporosis.

The major manifestations of the disease are undoubtedly due to the pancreatic lesion, although this is much aggravated by other anomalies¹³ such as the sweat glands¹⁴ tracheobronchial glands, salivary glands and the mucous glands of some parts of the gastrointestinal tract.¹³

Metabolic Diseases with Manifestations Attributable Only to Toxicity of Substances that Accumulate as a Consequence of the

Absence of Enzymes

Good examples of this category have come to light only recently. I shall discuss two such instances.

Galactosemia (galactosuria) is a metabolic disease in which there is little or no utilization of galactose. Its principal manifestations are catarract formation, brain damage and cirrhosis of the liver with jaundice and splenomegaly. Patients with this disease have been known to improve dramatically when placed on a galactose free diet.¹⁵ Indeed, a good many of them are now adults showing normal, physical and mental development. It is not known whether in the course of growth to adulthood they may acquire some measure of resistance to the toxic effect of galactose. What is known with certainty is that galactose is decidedly toxic to young infants and children. It is also toxic to newborn animals¹⁶ and is one of the potent causes of neonatal jaundice, a fact that is not commonly appreciated.^{17,18} There is hardly any utilization of galactose in

such patients and this may only amount to 1 to 3 per cent.¹⁹ Galactose accumulates in the blood and is excreted in the urine. Recently, it was shown that in addition to this there is also an accumulation of galactose 1-phosphate in the red blood cells of these patients.²⁰ This indicates that galactose metabolism was inhibited beyond this stage.

It has been known that galactose metabolism is dependent on three enzymatic steps. The first is phosphorylation of galactose to galactose 1-phosphate.²¹ This enzyme, termed galactokinase, is apparently normal in these patients. The second is incorporation of galactose 1-phosphate into a uridine nucleotide containing glucose 1-phosphate. The galactose merely replaces the glucose in this nucleotide according to the reaction: Uridinediphosphoglucose + galactose 1-phosphate to yield uridinediphosphogalactose and glucose 1-phosphate.²² The enzyme is called uridyl transferase.²³ The third step is the conversion of uridinediphosphogalactose into uridinediphosphoglucose.²² This reaction was described as the waldenase reaction and recently has been more properly renamed epimerase.²⁴

It has been shown lately that it is the transferase that is defective in galactosemia. The red cells and livers of these patients show practically complete absence of this enzyme.^{19,23} The epimerase is present in normal concentrations.

The fact that patients do very well when galactose is withheld from the diet, indicates clearly that the absence of the transferase enzyme *per se*, does not impair the metabolic function of the tissues in these patients. Further, the observation that symptoms of galactosemia appear only when galactose is ingested, point clearly to a toxic effect by galactose or any of its accumulated products. We have already indicated above that galactose 1-phosphate does indeed accumulate in red cells to a considerable extent.^{20,23} The toxic effect must reside in one or both of the accumulated products. A toxic compound can be toxic only by virtue of the fact that it can interfere in some enzymatic step in metabolism. It was not thought likely that free galactose would so interfere, for a number of reasons that are not within the scope of this discussion. It was felt that, inasmuch as galactose does not inhibit respiration of red cells from normal individuals, but in fact enhances oxygen uptake, then it could not be responsible for any toxic effects.²⁰ The notion that galactose

1-phosphate accumulation might have an unfavorable effect on tissue metabolism was then entertained. It was strongly suggested by the work on the mechanism of action of phosphoglucomutase, which has engaged our attention for the past few years.^{25,26,27} This enzyme converts glucose 1-phosphate to glucose 6-phosphate. It does so in the first step by transferring, from its active surface, its only phosphate group to carbon 6 of glucose 1-phosphate, to yield glucose 1,6-diphosphate. In the next step, the enzyme that has already lost its phosphate to carbon 6, proceeds to replace that loss by detaching the phosphate from carbon 1 of glucose 1,6-diphosphate, to yield glucose 6-phosphate. At the same time, it recovers the phosphate to its active site and is ready for another run of activity. It is worth repeating that it is essential for the enzyme to recover the lost phosphate in order to react with glucose 1-phosphate to produce glucose 6-phosphate.

It has recently been shown that galactose 1-phosphate is converted to galactose 6-phosphate by the same enzyme phosphoglucomutase. However, this occurs at a much slower rate, amounting to 1/400th of that of glucose 1-phosphate transformation.²⁸ On the assumption that this conversion follows the same pattern, it was predicted that galactose 1-phosphate would be a strong inhibitor of this enzyme by virtue of the slowness of its conversion. This would indicate that in the presence of both hexose phosphates, a good many of the enzyme molecules would, at any one time, be without a phosphate group on their active surfaces. The phosphate that the enzyme donates to carbon 6 of galactose 1-phosphate is not readily recoverable from carbon 1 of galactose 1,6-diphosphate because of the slowness of this reaction. In essence, then, galactose 1-phosphate acts as a trapping agent for the phosphate of the enzyme. As we indicated above, the dephosphorylated enzyme is inactive towards glucose 1-phosphate, its normal substrate.

Using rabbit enzyme, it was possible to show that about one hundredth of the concentration of galactose 1-phosphate obtained in the red cells of galactosemic patients, sufficed to inhibit the activity of phosphoglucomutase about 80 per cent when tested *in vitro*.²⁹ This is a high degree of inhibition when it is recalled that this enzyme plays an important role in carbohydrate, nucleic acid and mucopolysaccharide synthesis. This magnitude of inhibition can well explain the toxicity

of galactose 1-phosphate to the brain, producing mental deficiency; to the liver, resulting in cirrhosis and jaundice; to lens tissue, producing cataract; to kidney tissue, producing albuminuria and aminoaciduria; and to the body metabolism as a whole resulting, in slowness of growth.

Galactosemia then represents a perfect example of this disease entity where there is an absence or deficiency of the uridyl transferase enzyme. Such a defect in itself, is not detrimental to the well-being of the individual involved. The danger lies in the ingestion of galactose compounds which result in a considerable accumulation of galactose 1-phosphate in tissue cells. This produces an inhibition of phosphoglucomutase activity by the simple incorporation of galactose 1-phosphate into the mechanism of the enzymatic reaction to trap the essential active phosphate group of the enzyme. I dare say that this makes galactosemia one of the best understood diseases in pediatrics.

Another disease has been described during the past few years that may well fit into this category. It is *congenital familial nonhemolytic jaundice with kernicterus*.³⁰ In this disease, there accumulates in the serum of patients the direct type of bilirubin.^{31,32} The disease has a very definite genetic background.³³ It was suggested, from load experiments, that the liver in such patients, is incapable of excreting bilirubin at an adequate rate when the bile pigment is at normal serum levels.³⁰ Because the accumulated bilirubin was found to be of the indirect type, it was further suggested that more precise defect would most likely be an inability of the liver to convert indirect to direct bilirubin.³³ This was based on a similar type of reasoning advanced earlier to explain jaundice in the premature³⁴ and the occurrence of hyperbilirubinemia in a strain of rats with hereditary congenital jaundice.³⁵

The patients so afflicted mostly died in early infancy with clear-cut evidence of kernicterus. There was no definite pathologic findings noted in any organ with the exception of bilirubinemia. All these children appeared normal at birth. Jaundice appeared rapidly and was maintained at a high level of severity throughout the period of observation. In most patients no evidence of kernicterus appeared during the first few weeks of life and in one instance, did not become evident until two to three months of age. There were two children who never developed any central

nervous system manifestations and are still alive. One is seven (J. D. H.) and the other (M. E. H.) is four years old. They are both in perfect health except for the ever-persistent jaundice of about 20 mg. per cent of indirect bilirubin. The prognosis in these two cases nevertheless, should remain guarded particularly in the light of a recent report of one similar case developing kernicterus at the age of three years.³⁶

It has been shown lately that bilirubin obtained from bile is in the form of a glucuronide conjugate.^{37,38} The linkage occurring at the propionic acid groups.^{37,39,40,41} Studies of this enzymatic step in animals showed that newborn and fetal livers virtually lacked the ability to conjugate bilirubin, whereas adult animal livers contained an active enzyme.⁴² It then appears that this enzyme develops to a large extent after birth, at least in the guinea pig. The observations with newborn infants³⁴ seem to indicate also that the enzyme is poorly developed in the human liver at birth. However, it develops rapidly shortly after birth. This indeed would be enough to explain the occurrence of physiologic jaundice and its disappearance that coincides with the full development of this enzyme system. This might be true only if the mechanism of transport and excretion of bilirubin is dependent on this enzyme.

Should this enzyme fail to develop it would result in accumulation of indirect bilirubin in the serum of newborns. A clinical picture would then result similar to that obtained in the cases discussed above. If the accumulated bilirubin is toxic to tissues at a particular stage of their neonatal development, then manifestations of toxicity would develop. It may well be that kernicterus is produced in this manner, considering the fact that bilirubinemia is the common denominator in practically all cases showing kernicterus. These include blood group incompatibility, hemolytic disease of the new born, jaundice in the premature, overdosage with vitamin K or its analogues in the early newborn period et cetera, as well as the cases referred to above.⁴³ Studies on the two surviving cases indicated a considerable reduction in the glucuronide conjugating system using salicylate and compound F as glucuronide acceptors.⁴⁴ The possibility that bilirubin is actually toxic is supported by *in vitro* studies which showed an inhibitory effect on brain respiration.

The fact that the two surviving cases with

bilirubinemia still appear for all practical purposes, in good physical condition, showing normal growth and development, suggests that this familial and inherited disease, like many other heritable diseases, expresses itself with different levels of severity. It is interesting that in the first series of seven cases reported,³⁰ the only survivor (J.D. H.) showed serum bilirubin levels well below three of the five cases studied and who died with kernicterus. Proceeding on the premise that the damage done, results from the accumulation of the indirect bilirubin in serum, this disease then clearly fits into this category of heritable disorders of metabolism. This defect in itself is presumed not to be detrimental to the health of the individual until the metabolite concerned (free bilirubin) reaches a certain toxic level in the serum. In fact a similar defect is described in adults, and referred to as *familial non-hemolytic jaundice*. It is basically a defect in the excretion of bilirubin and presumably involving the same enzyme system. Here bilirubin also accumulates in the serum, but to levels far lower than those observed in the entity described above. No kernicterus develops nor any other manifestation of damage to any organ.⁴⁵

In all respects then this disease resembles galactosemia where the accumulation of galactose to high level causes the damage and not the enzyme deficiency *per se*.

Metabolic Diseases with Manifestations Attributable Both to the Absence of Enzymes and to the Toxic Products that Accumulate Therefrom

Again metabolic diseases that fall in this category have been defined only recently.^{2,3,10}

Glycogen storage disease, as brought out earlier in this discussion, is classified into four types. One shows only a deficiency in glucose 6-phosphatase. Another shows no such defect and the glycogen structure is normal. The other two types represent instances where the glycogen structure is abnormal. The glycogen molecule may be more branched or less branched than it is normally. The last two types belong to this category.

It is necessary at this point to describe briefly the formation of normal glycogen. Suffice it to say that glycogen is a branched polysaccharide composed of glucose residues. One glucose unit is linked to another mostly by a carbon 1 to

carbon 4 linkage. This straight chain type of linkage is formed or broken by the reversible action of the enzyme phosphorylase. There have been no instances to date that revealed a defect in this enzyme. At the branch points, another type of linkage exists. Carbon 1 of one glucose unit is linked to carbon 6 of another. In this linkage two enzymes participate. The brancher (transglucosidase) forms this linkage and the debrancher (glucosidase) breaks it. Thus, for the synthesis of the tree-like glycogen structure, phosphorylase and the brancher co-operate. For its breakdown phosphorylase and the debrancher work together.

It would be easy to see that a defect involving the brancher results in the synthesis of a polysaccharide with few branches. In that respect it would resemble starch. On the other hand, should the debrancher be deficient, the polysaccharide formed would be highly branched, inasmuch as, the brancher enzyme remains unopposed for lack of debrancher activity.

It appears that both of these abnormal glycogens do not break down readily and therefore accumulate in the affected organs. The liver is involved in both types. Muscle involvement is more commonly seen in the type where the debrancher is deficient. It has also been supposed that these abnormal glycogens stimulate fibrosis and result in destructive changes in the musculature and cirrhosis of the liver. In this manner glycogen behaves as a foreign body.

The metabolic disturbances in such cases, though present, are not as severe as those observed in the type where glucose 6-phosphatase is deficient. The main manifestations are secondary to mechanical and fibrotic alterations. This gives rise to symptoms of cirrhosis in the liver with splenomegaly, hypoproteinemia, anemia, compensatory venous dilatation and ascites. In muscle tissue the symptoms are muscle weakness, sometimes resembling amyotonia and also cardiac failure.^{6,7,46}

It is clear then that the absence of these enzymes in each instance is detrimental to the organism in that glycogen is stored in large quantities and is not readily available to the particular tissue for metabolic purposes. The secondary effects of the accumulated glycogen is even more detrimental and indeed responsible for the fatal outcome.

Another disease entity that falls within this

group is *phenylketonuria*, more generally known as phenylpyruvic oligophrenia.

The fundamental anomaly in this disease has lately been clarified. In essence, it is an inability to convert phenylalanine to tyrosine. This hydroxylation reaction, catalyzed by hydroxylase, occurs in the liver and involves two components.⁴⁷ Fraction I is unstable and is present only in liver tissue. Fraction II is stable and is found in all tissues. Recent reports indicate that fraction I is lacking or deficient in the livers of these patients.^{48,49}

The inability to hydroxylate phenylalanine explains most of the chemical manifestations of the disease. These include an accumulation of phenylalanine in the blood and spinal fluid, the appearance of phenylpyruvic acid, phenyllactic and phenylacetic in the urine.^{50,51} The symptomatology of the disease includes in the main, mental deficiency, blonde hair and blue eyes, eczema and convulsions. It is true that symptoms may appear very early in infancy, yet it is difficult to evaluate many of the specific diagnostic criteria in the newborn or in the early postnatal period. Retardation, mental and physical, should however, be apparent well before the age of six months. Chemical tests of course, would be meaningful at any age. The variability in the manifestations of this disease however, should be very carefully considered in assessing the developmental state of the patient.⁵²

It is entirely possible that the newborn child may be normal and that damage ensues later on when phenylalanine accumulates in the blood. However, the reason for including phenylketonuria in this category, rests on a belief that the fetus in utero is likely to suffer damage because of the absence of the hydroxylase. Otherwise, this disease entity would have been placed in the same category with galactosemia. It may well be that further studies may so indicate.

Numerous observations point to the fact that phenylalanine, or one of its metabolites, may indeed be toxic.⁵³ Phenylacetic acid is excreted as a glutamine conjugate. Its excretion in this form is particularly high in severely defective patients.⁵³ One wonders whether the drain of glutamine may not be responsible for some of the manifestations of this disease, particularly that glutamine is concerned with ammonia fixation in the brain. Patients with this disease maintained on diets low in

phenylalanine showed striking improvements in their symptoms. It was noted that convulsions stopped with a disappearance of abnormal electroencephalographic patterns. There was a measurable improvement in the physical and mental development of the child. Following the reintroduction of normal dietary levels of phenylalanine, a reversion to the original status was observed in most symptoms of all cases observed.⁵¹⁻⁵³

It is obviously important to start the therapeutic diet as early in life as possible. It is only then that one can ascertain whether any prenatal damage had occurred. Judging by the encouraging reports to date, it may well be that keeping the phenylalanine intake at a minimum, will result in normal growth and development. In that case a patient with phenylketonuria could then enjoy the status so far accorded the galactosemic child, who now can grow and develop unmolested by the grave and potential threat that lies within.

Acknowledgments

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STRESS VS. HEART DISEASE

Socioeconomic stress "peculiar to and characteristic of the middle and upper class male of western society" rather than dietary fat intake is suggested as a possible cause for the high incidence of coronary artery disease by two California investigators.

Drs. Meyer Friedman and Ray H. Rosenman of the Harold Brunn Institute, Mount Zion Hospital, San Francisco, conducted a detailed dietary survey of forty-six women and their husbands belonging to an upper economic stratum. The caloric and percentage of fat intakes of the two sexes was found to be almost identical.

From a critical review of various data relating to a known relative immunity of the American woman to clinical coronary disease, the authors conclude that this immunity cannot be due entirely to some endoc-

rine-induced protection against the supposed atherogenic properties of a high-fat diet. Protection against this disease does not appear to be a sex-linked phenomenon in all races; also, this relative immunity dwindles with hypertension and disappears with diabetes.

The authors point out that the fat intake of several races is comparable to that of the middle-class or upper-class American, yet their incidence of coronary artery disease is almost nonexistent. In most epidemiologic studies, "little attention has been paid to the really striking fact that immune groups invariably have belonged to either the lower socioeconomic class of western society or to groups not belonging to this society. Conversely, only middle and upper class western man has this disease in abundance."—FRIEDMAN, M., and ROSENMAN, R. H.: Comparison of fat intake of American men and women. *Circulation*, 16:339 (Sept.) 1957.

Infantile Cortical Hyperostosis

Report of a Case in an American Indian

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WEST¹ and others in 1888 published reports concerning acute periosteal swellings in infants, but there were no roentgenograms to prove the diagnosis since x-rays had not yet been discovered. Roske,² in 1930, first described an unusual bone condition in an infant which he

Thoman and Murphy⁹ in 1950 reported the first and this is believed to be the second case occurring in an American Indian.

Classically infantile cortical hyperostosis occurs from the last month *in utero*^{10,11,13} to the first six months of life.¹² It has been found in siblings¹¹

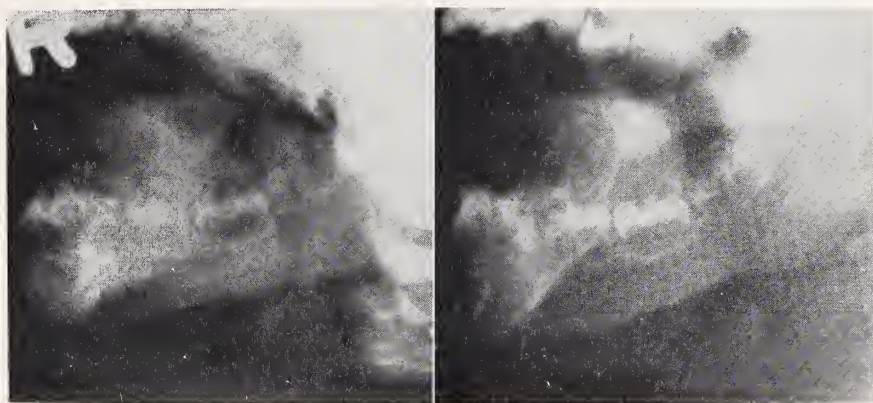


Fig. 1. (A) Right mandibular cortical hyperostosis in lateral oblique projection at four months of age. Condyles are not affected. The body and rami are thickened. (B) Same mandible at eight months of age, showing complete regression of lesion.

believed to be a new disease entity. It was dramatized by Caffey and Silverman³ in 1945, Caffey⁴ in 1946, and Smythe, Potter, and Silverman⁵ in 1946, who gave complete clinical and roentgenographic reports of this syndrome and named it infantile cortical hyperostosis. Caffey⁴ in 1938, 1939, 1940, and 1944 had seen four cases of cortical hyperostosis in infants which were not due to luetic infections. Ross and Burke⁶ suggested the name Caffey-Smythe syndrome. Walley⁷ in 1953 chronologically arranged the first forty-three reported cases of this disease. In 1954, Sidbury⁸ reported that there were over sixty cases in the literature. More than a dozen cases have been reported since then.

Infantile cortical hyperostosis has been reported in all ethnic groups throughout the world.

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and in the second generation.¹⁰ Bennett and Nelson¹³ reported the first prenatal case in 1953. The duration of the disease is variable with frequent remissions and exacerbations. One area of bone may heal while another area becomes involved. New lesions are rare after the first year of life and the entire course of the disease may be only three months. Lesions can heal and recur in the same site. Rib lesions show the most rapid healing. The average age at onset in the first sixty-nine cases reported was nine weeks.

This disease usually runs a benign course, but Caffey¹⁴ described some late chronic changes in a few cases resulting in crippling residuals. In most cases there is a sudden onset of swelling of the face, jaw, extremities or thorax accompanied by fever, hyperirritability, periods of remission and exacerbation and roentgenographic evidence of diaphyseal subperiosteal new bone forma-

tion. Most bones have been involved except the metacarpals. The mandible and clavicle are most commonly involved. Multiple osseous

changes,^{4,5,18,19,22} but Kane and Borzell²³ and Larkin and Rousseau²⁴ found inflammatory infiltration with periosteal hyperplasia. Smythe⁵ re-

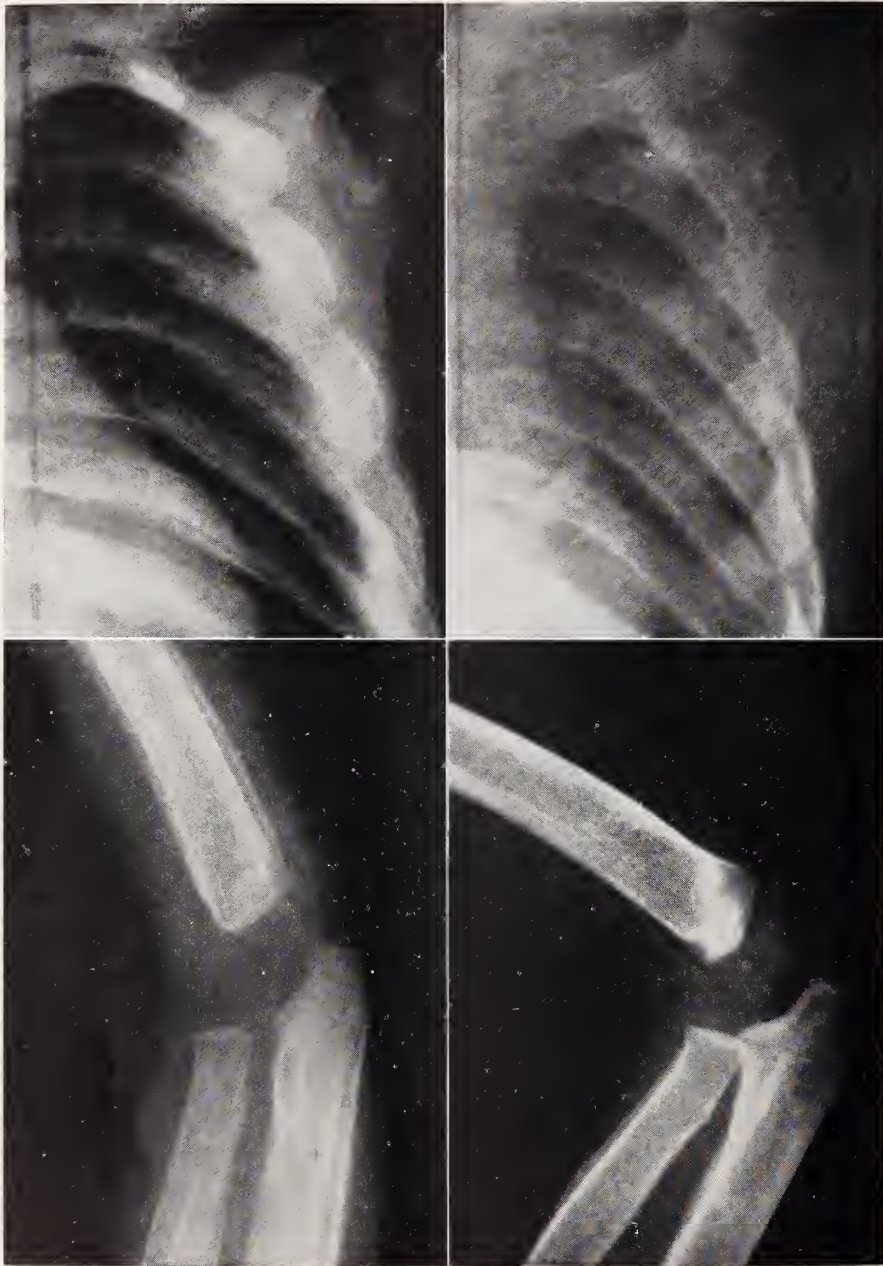


Fig. 2. (*above*) (A) film of portion of left upper chest at four months of age, showing severe cortical hyperostosis of left clavicle, the ribs, and minimal changes in the scapula. (B) Same area at eight months of age, showing minimal changes in the clavicle but almost complete regression in the ribs.

Fig. 3. (*below*) Right elbow at four months of age, showing moderate to severe cortical hyperostosis of humerus, ulna and radius. Lamination of the calcium deposits is seen. (B) At eight months of age, the humerus has cleared, but a pathologic condition persists in the forearm.

involvement is usual, but Coley¹⁵ described four cases of monostotic disease which were first considered primary malignant tumor. Etiology is unknown, although many theories have been advanced.^{4-6,8,11,16-21} Few biopsies have been done. Most of those done show noninflammatory

ports muscle and connective tissue changes. Autopsy reports, although few in number, have been normal except Mossberger's patient, who probably died of typhoid fever.¹⁸ Diagnosis is suspected clinically by brawny tender swelling of the jaw or limbs, fever, anemia, leukocytosis, and irri-

tability. Roentgen study confirms the diagnosis. Where the mandible only is involved diagnosis is more difficult.

No tuberculosis or syphilis was present in either parent.

Physical examination revealed the forearms to be thickened and to have a very woody feeling. Clavicles,



Fig. 4. (*above*) (A) Massive cortical hyperostosis in left femur at four months of age. Both femorae are equally affected. (B) Right femur four months later, showing considerable cortical hyperostosis remaining.

Fig. 5. (*below*) (A) Massive hyperostosis of left tibia and fibula with laminar deposition at age four months. (B) At eight months, there has been complete regression.

Case Report

E. S., a Chippewa Indian boy four months of age, was admitted on September 1, 1955, to St. Francis Hospital from the Red Lake Indian Reservation because his mother said "There was something wrong with his arms and shoulders." Two other siblings, three years and eighteen month old, were healthy. Birth weight was thirteen pounds and thirteen ounces.

arms, and legs were tender. One could not pick up subcutaneous tissues between the fingers. Similar hard lumpy masses were present over the thighs and clavicles. The mandible was not swollen. Laboratory studies showed normal urine. Serologies of the patient and his mother were negative. Blood studies showed hemoglobin 10.25 gm. per 100 cc.; red blood cells 4,890,000 per c.mm.; white blood cells 14,000 per c.mm.; differen-

tial white count was normal. Electrocardiogram was normal. Serum alkaline phosphatase was 37.5 King and Armstrong units. Serum calcium was 4.9 milliequivalents per liter or 9.8 milligrams per 100 cc.

Roentgenographic studies (Figs. 1-5) showed extensive internal cortical atrophy, some marrow cavity expansion, and external swelling of the shafts of the ulnae, radii, humeri, fibulae and tibiae. Only the diaphysis of these long bones was involved. The epiphysis and metaphysis were spared. Severe subperiosteal cortical hyperostosis was most marked in the thighs, forearms, clavicles, and ribs. The mandible was involved on both sides but most marked on the right side. The jaws were not swollen. Cortical overgrowth also involved the scapulae to a moderate degree. Skull, vertebrae, carpal, and metacarpal, tarsal, metatarsal, pelvis, and phalanges of the hands and feet were not involved. Roentgen examination of the chest and barium study of the esophagus and stomach revealed a normal condition.

During the initial two-week hospital stay, this child had a temperature of 99-102° F., reaching normal values upon hospital discharge. Bottle feeding was difficult, and the child cried whenever the arms, legs or chest were touched. Pabulum formula was rejected, and the child refused to chew.

Differential diagnosis of luetic periostitis, scurvy, rickets and vitamin A intoxication were excluded by the roentgen picture of diaphyseal involvement only, negative serology, history of previous vitamin intake, laboratory studies, and the typical clinical findings of anemia, fever, irritability and response to supportive therapy.

On January 25, 1956, nearly five months later, this infant was seen in the clinic for re-examination and roentgen study. Weight was now sixteen pounds, nine ounces, ribs were prominent, arms and legs were not as lumpy or woody feeling as before. The child sat up and tried to crawl. Roentgen examination shows complete healing of the mandible, scapulae, most of the ribs, tibiae, fibulae, humeri and residual cortical hyperostosis of the femorae, radii, ulnae, clavicles, and several of the ribs. Clinical improvement had been excellent. Correspondence with the physicians at the Red Lake Indian Reservation Hospital since then relate continued improvement to normal. Roentgen studies done April 1, 1957, at the Indian Reservation by Drs. Lane, Ghrist, and Kidd show complete recovery of all involved bones to normal with no residuals.

Comment

The benign course of this disease and the excellent prognosis is well known. Rapid recovery was evident on re-examination nearly five months later. One year later no residuals to palpation were present. Nineteen months later all involved bones were normal following roentgen study.

The treatment of this child was supportive. There appeared to be no proven method of care in the literature.²⁵ Brailsford¹⁶ advocates ascorbic acid, Sidbury⁸ and Pounders and Delhot²⁶ re-

port excellent results with cortisone and hydrocortisone. Bowman, Cosby, and Piston²⁰ reported two cases which improved after milk was removed from the diet. de Córdova and Pessino,²⁷ however, had poor results using hormones.

Although extensive bone disease is present, these infants continue to grow and develop normally. It is not a rare entity and should be suspected in any infant with anemia, leukocytosis, hyperirritability, fever, and swelling of jaws or limbs. Brooksaler and Miller²⁸ reported eleven cases in six years.

Summary

A brief review of the history, clinical picture, laboratory findings, roentgen findings, etiology, prognosis and therapy of infantile cortical hyperostosis has been given. Another case in an American Indian infant is presented. The diagnosis can be suspected clinically and is proven by complete body roentgen study.

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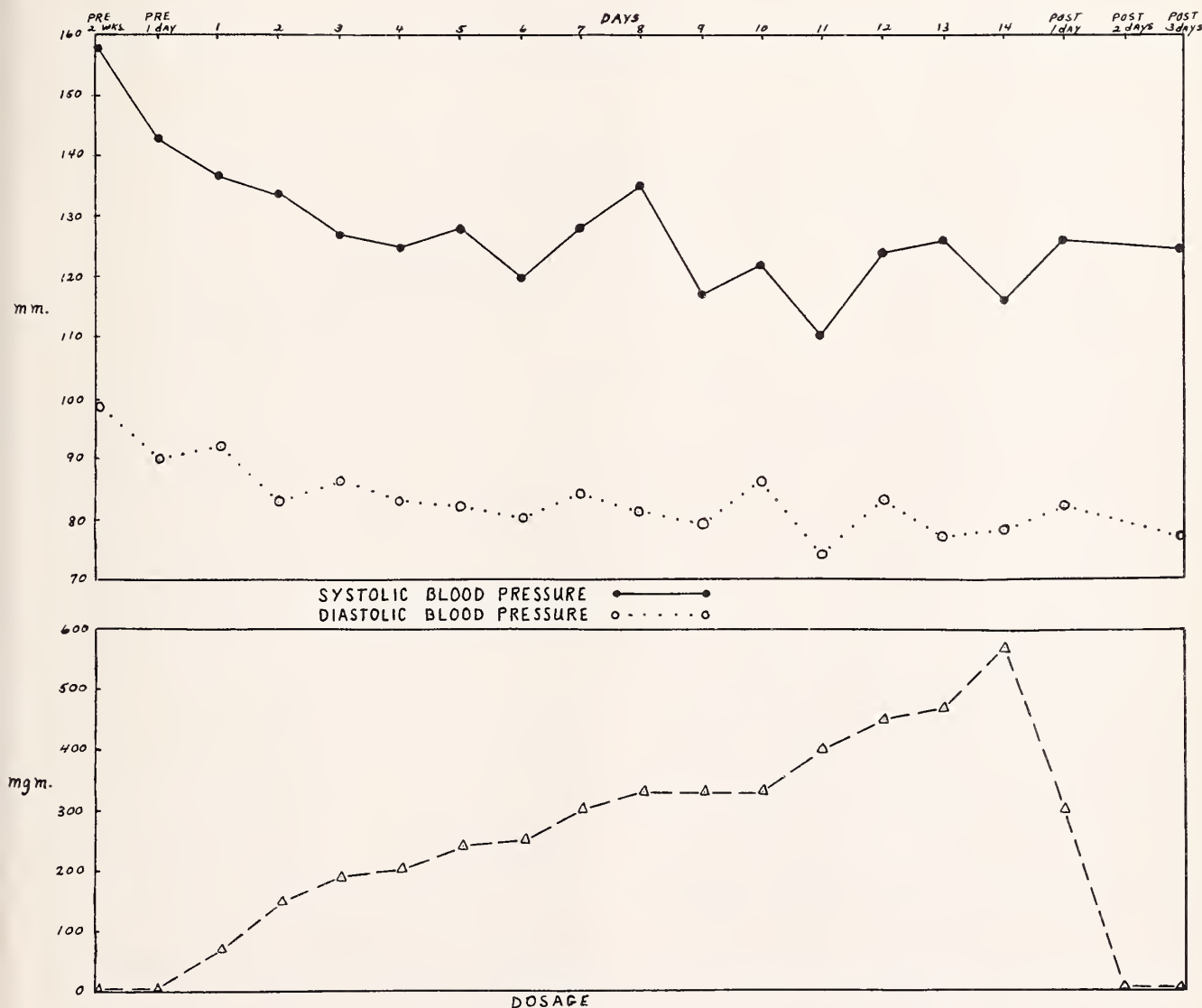
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Pilot Study of Effects of Stimulant Drugs on Regressed Patients

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RECENT literature has been crowded with reports of the effects of tranquilizing drugs on the overactive, disturbed patient. Relatively little research has been done on the chemothera-

peutic approach to the equally large problem of the regressed patients that crowd mental hospitals. The authors hypothesized that, if tranquilizing drugs calm the overactive patient, stimulating



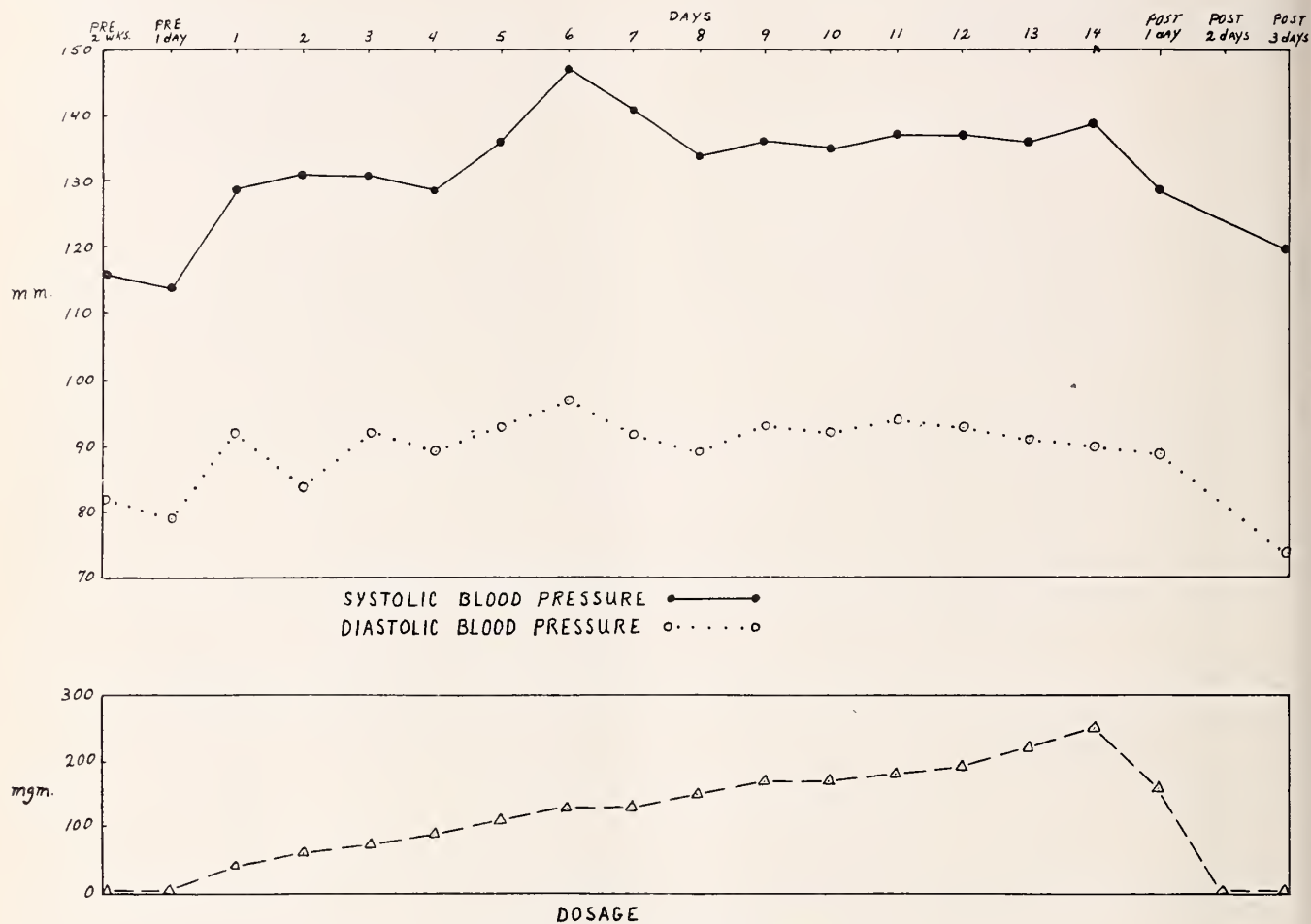
GRAPH 1. PLACEBO GROUP.

Dr. Sommerness, formerly on the staff at Fergus Falls State Hospital, Fergus Falls, Minnesota, is now Superintendent at Traverse City State Hospital, Traverse City, Michigan. Mr. Lucero, formerly at Fergus Falls, is now a senior clinical psychologist at Willmar State Hospital, Willmar, Minnesota.

drugs might cause the regressed patient to become more alert and responsive to his surroundings and thus acquire a higher level of social adjustment. The authors decided to carry out a small

pilot study to determine whether there would be reason to run a full scale research project to test this hypothesis.

day. The experiment continued for fourteen days. The dosage was cut in half on the fifteenth day and discontinued on the sixteenth day. The in-



GRAPH 2. RITALIN GROUP.

Procedure

Twelve of the most regressed men patients in the 1800-bed Fergus Falls State Hospital were selected for this study. The patients were placed in three groups: one group to receive placebo; another, Ritalin (methyl-phenidylacetate hydrochloride, Ciba); and the third group, Wyamine (mephentermine sulfate, Wyeth). Behavior ratings^{1,2} were done immediately before and after the experiment to determine if there was improvement in the overt social behavior of the patients. Blood pressures were taken every day of the experiment as a clinical safeguard to the patients because of the effect stimulating drugs might have on blood pressure. Red and white blood counts and hemoglobins were determined pre- and post-experimentally. The experimenters met with ward personnel and patients once daily to observe the patients and determine the dosage for the next

TABLE I. BLOOD STUDIES

Hemoglobin Per Cent			
	Pre	Post	Difference
Placebo	95.75	89.50	-6.25
Ritalin	93.00	89.25	-3.75
Wyamine	88.50	88.75	+ .25

Red Blood Count			
	Pre	Post	Difference
Placebo	5,265,000	5,322,500	+ 57,500
Ritalin	5,122,500	5,150,000	+ 27,500
Wyamine	5,320,000	5,085,000	-235,000

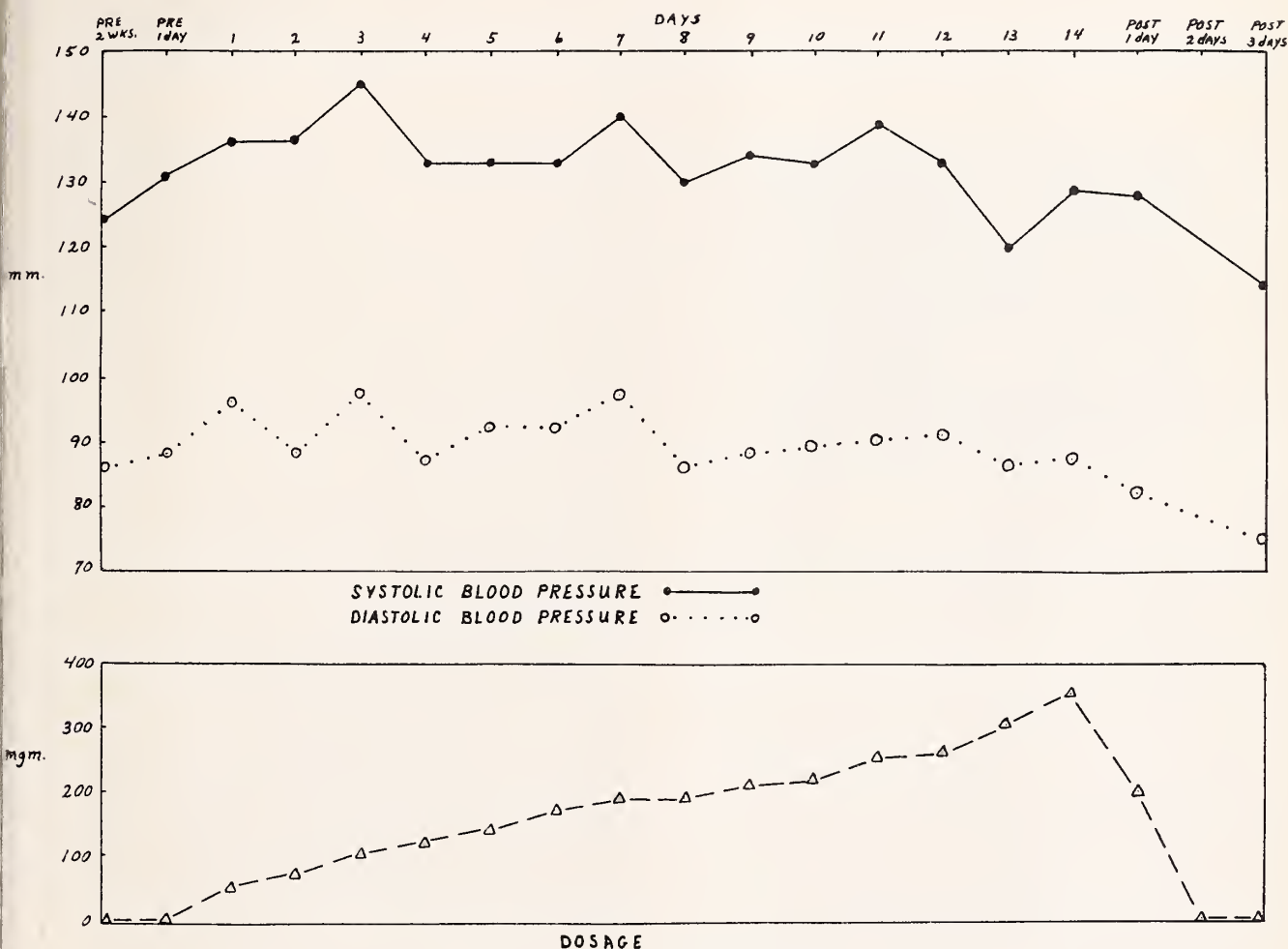
White Blood Count			
	Pre	Post	Difference
Placebo	10,187.50	9,975.00	-212.50
Ritalin	9,537.50	8,875.00	-662.50
Wyamine	10,862.50	10,475.00	-387.50

tent was to increase the dosage until patients' behavior level improved as noted by the experimenters' clinical observation or until untoward physical effects were manifested. The dosage of

placebo varied from a beginning average of 75 mg. to a final average of 560 mg. per patient per day, that of Ritalin from 40 mg. to 250 mg., and that of Wyamine from 50 mg. to 350 mg.

Discussion

The results with regard to behavior, although obviously inconclusive due to the small number



GRAPH 3. WYAMINE GROUP.

Results

The patients' behavior was the same at the end of the experiment as at the beginning for all three groups as noted by behavior ratings and clinical observation.

As can be seen from Table I, there was no apparent significant change in red blood count, white blood count or hemoglobin between the beginning and end of the experiment in any of the three groups.

As can be seen from Graph 1, the placebo group varied from an average beginning blood pressure of 143/90 to a final blood pressure of 116/78. Graph 2 shows the Ritalin group varying from 114/79 to 139/90. Graph 3 indicates that the Wyamine group varied from 131/88 to 129/87.

of patients involved and the relatively short period of drug administration, discouraged the authors from carrying out a full scale experiment at this time. The most interesting result of this study was a totally unexpected one. Blood pressures of the patients receiving the stimulant drugs showed a slight increase in comparison to those receiving placebo, but this increase was in no way as drastic as would be expected with the dosages of the drugs given. Although further research is certainly indicated using normal subjects, it can be stated that relatively massive dosages of Ritalin and Wyamine have no undue, untoward effect on the blood pressure of the regressed mental patient.

(Continued on Page 839)

Respiratory Acidosis

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ALL TOO frequently pulmonary function is considered as independent of total body function. Just as patients with pulmonary tuberculosis have been isolated from other medical patients, so has the ventilation of the lungs been considered in an isolated category by many clinicians.

A study of respiratory acidosis and the acid-base balance of the body affords an excellent opportunity to appreciate the relationship of alveolar ventilation to the general metabolic demands. Although many organs, particularly in the digestive system, secrete fluids with a pH considerably different from that of the circulating fluids, the lungs and the kidneys carry the burden of maintaining the pH of the internal environment at a relatively steady level (Fig. 1). The lungs are the agency of immediate stabilization, as pulmonary adjustments may be made in minutes whereas renal adjustments require hours or days.

Significant reduction of the functional reserve of the lungs or the kidneys limits their ability to adjust to unusual metabolic demands. Transient disturbances in acid-base balance then result during such demands. As function becomes more severely limited, chronic acid-base imbalance may occur at rest with minimal metabolic requirements and defy even the most energetic therapeutic measures.

Inadequacy of alveolar ventilation causes retention of carbon dioxide, which is accompanied by respiratory acidosis. This disorder often is considered to be associated with primary pulmonary disease, particularly diffuse obstructive emphysema. However, respiratory acidosis of a transient nature may be seen much more frequently in patients with normal lungs if one considers hypoventilation during general anesthesia. This problem confronts the anesthesiologist continually unless adequate ventilation is provided. It must

be remembered that alveolar ventilation is related to the tidal volume less the dead space.

Sudden Acidosis in Generally Normal Lungs

In considering the mechanisms of CO₂ retention and respiratory acidosis it is appropriate to begin with conditions in a normal lung which is being ventilated with a relatively high, although not perfect, degree of evenness. If the respiratory center is depressed by a general anesthetic agent or excessive doses of opiates or sedatives, mechanical assistance must be maintained until the respiratory center recovers. If the patient is breathing room air, cyanosis gives warning of inadequate ventilation and spurs attendants into action. This obvious indicator is not present, however, if high tensions of oxygen are being administered. Those responsible for the patient's care during anesthesia must be made cognizant of the dangers of respiratory acidosis despite the normal color of the skin and mucous membranes in this circumstance.

Chronic Acidosis and Renal Buffering

A variety of diseases involving the thoracic wall and diaphragm and the accessory muscles of respiration lead to a chronic state resembling temporary pharmacologic depression of the respiratory center. Among these are the residual paralysis of poliomyelitis and diseases with similar neuroanatomic distribution, severe kyphoscoliosis, and extreme obesity.¹ In these conditions the bellows mechanism producing tidal volume is inadequate as a consequence of decreased muscular strength or mechanical impairment preventing efficient muscular activity. Inadequate CO₂ elimination allows the alveolar CO₂ tension to rise, with a similar rise in CO₂ tension in the blood. The buffering action of the kidney eliminates chloride ions, resulting in partial restoration of the normal ratio of bicarbonate to CO₂ and normal pH.

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The related functions of the lungs and kidneys in maintaining a normal pH of the blood are most simply expressed by the Henderson-Hasselbalch equation.

$$\text{pH} = \text{pK} + \log \frac{\text{BHCO}_3}{\text{H}_2\text{CO}_3}$$

(B=base, such as sodium or potassium)

Since CO_2 moves in and out of various body compartments in response to difference in partial pressure (pCO_2), this term can be substituted in the formula because for each unit of partial pressure expressed as millimeters of water 0.0301 millimole of CO_2 dissolves in water to form H_2CO_3 .²

$$\text{pH} = \text{pK} + \log \frac{\text{BHCO}_3}{0.0301 \cdot \text{pCO}_2}$$

It may be seen that an increase in pCO_2 without change in BHCO_3 will cause the pH to decrease, leading to respiratory acidosis. Then as the BHCO_3 increases, the normal ratio of 20 to 1 is approached; and the acidosis may become partially offset by this buffer system.

Clinically, it is important to have some information about the unknown factors in this equation—the pH, the bicarbonate (or alkaline reserve), and the CO_2 . Accurate knowledge of any two would allow calculation of the third; but unfortunately, only the alkaline reserve can be measured with facility in most clinical laboratories. A high alkaline reserve could indicate metabolic alkalosis or partially compensated respiratory acidosis; the alkaline reserve could be normal in uncompensated respiratory acidosis. Knowledge of the clinical course of the patient is therefore an essential. If conditions which could lead to alveolar hypoventilation are present, then a high alkaline reserve would support a diagnosis of respiratory acidosis. If acute complications or changes appear which decrease elimination of CO_2 by the lungs or increase production of CO_2 by the body, or have both effects, then the alkaline reserve may be normal if the renal mechanisms have not had time to act. Such conditions as pneumonia, severe bronchitis or bronchospasm, or marked exertion with limited ventilatory reserve might lead to a transient rise in pCO_2 without compensatory rise in BHCO_3 if adequate elimination of CO_2 is promptly restored.³

Acidosis in Primary Pulmonary Disease

These disturbances are much more complex in primary pulmonary disease. Carbon dioxide retention occurs when diffuse emphysematous

ELEMENTS OF ACID-BASE REGULATION

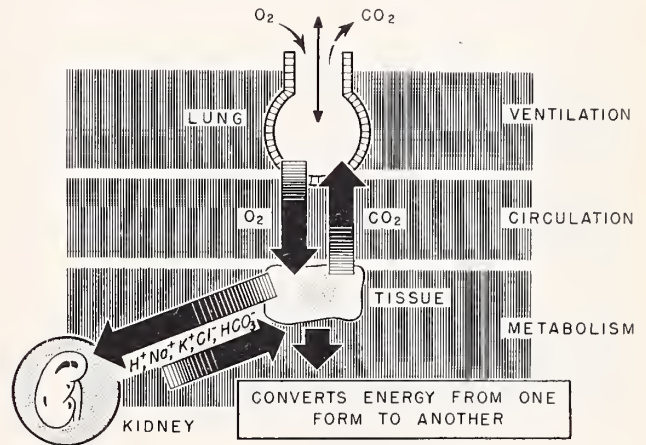


Fig. 1. The maintenance of normal pH of body fluids depends on the rate at which the lungs eliminate CO_2 and the kidneys eliminate the various fixed electrolytes in relation to their concentrations within the circulating fluids.

changes are present. Diffuse interstitial fibrosis, although characterized by hypoxia associated with impaired diffusion of oxygen, is not accompanied by CO_2 retention because diffusion of CO_2 occurs much more rapidly across the alveolocapillary membrane and because alveolar ventilation in interstitial fibrosis is usually equal to or actually greater than in normal lungs. If significant emphysema complicates some types of pulmonary fibrosis, CO_2 retention may follow.

The variation in turnover rate of gases in various alveoli and other air spaces in emphysematous lungs is great. Large portions of the lungs are underventilated, but in other portions the alveoli are actually hyperventilated. By this compensatory mechanism CO_2 may be adequately eliminated from the lungs even in the presence of hypoxia. The balance can continue as long as enough hyperventilated alveoli are being perfused with an adequate amount of mixed venous blood. Once the proportion of the lungs which is underventilated becomes so large that hyperventilated and perfused portions cannot compensate for underventilated portions, CO_2 retention and respiratory acidosis ensue (Fig. 2).

If this decompensation occurs as a result of

bronchopulmonary infection, retained secretions, or bronchospasm, energetic treatment with appropriate antibiotics, oxygen, and bronchodilators, and mechanical assistance and exsufflation if necessary, may reverse the trend.³ But if reten-

tion of CO_2 is chronic in the absence of these complications, the problem is even more difficult. The potential dangers of aggravating the hypoventilation by administration of high tensions of oxygen to patients with severe emphysema are well known. That the respiratory center in these patients loses sensitivity to increased CO_2 in the blood is generally appreciated also, although the mechanism by which this occurs is not clear. In this advanced stage of emphysema the work of breathing is many times normal, even when at rest with a relatively small minute ventilation. This increased work places an increased metabolic demand on the lungs for supplying oxygen and eliminating CO_2 . Thus an attempt to increase the ventilation to eliminate CO_2 may conceivably result in production of more CO_2 than the inefficiently ventilated lung can eliminate. Usually, at this stage, a relatively minor respiratory infection or cor pulmonale may lead to the patient's demise.

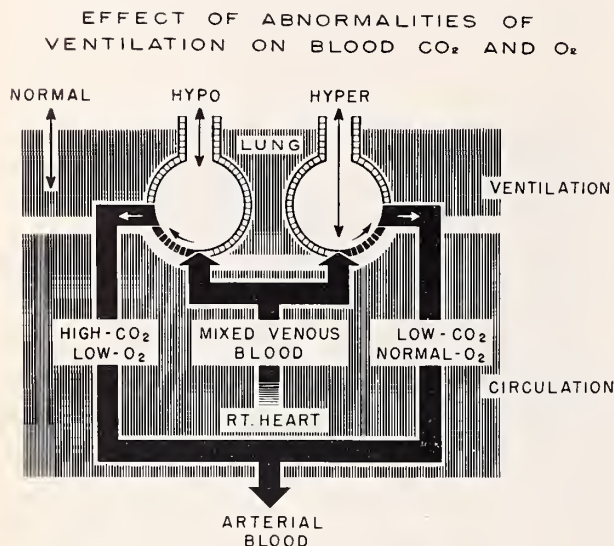


Fig. 2. In pulmonary emphysema the wide variation in ventilation of various alveoli may lead to inadequate oxygenation of the mixed venous blood perfusing the underventilated alveoli and incomplete elimination of CO_2 . If hyperventilated and perfused alveoli are numerous, sufficient CO_2 may be eliminated, thus compensating for the retention of CO_2 in other areas. However, oxygenation of the blood can only reach normal (essentially complete) and thus cannot compensate for incomplete oxygenation in the hypoventilated areas.

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INFANTILE CORTICAL HYPEROSTOSIS

(Continued from Page 830)

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Ligneous Appendicitis Simulating Malignancy of the Cecum

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IT IS with interest that one may note the rarity of a nonspecific granulomatous condition involving the appendix, cecum, terminal ileum and neighboring structures. This entity has been described under several titles such as "Infectious Granuloma,"¹ "Ligneous Inflammation of the Cecum,"² and "Nonspecific Granuloma."³ The clinical impression is frequently malignancy of the cecum or appendiceal abscess. The preoperative diagnosis in two of the cases to be reported was carcinoma of the cecum and in the third case, appendiceal abscess or malignancy. This preoperative impression was based on the presence of a hard, firm mass in the right lower quadrant. However, the presumptive diagnosis in the first two cases was not supported by anemia or characteristic x-ray changes. In retrospect, the absence of anemia and lack of usual x-ray deformity of the cecum pretty well ruled out malignancy.

The pathological aspects of Ligneous appendicitis have been ably described by Wilson, et al.^{4,5} Therefore, only brief comment is needed to explain the principal pathologic condition involved in the production of these massive granulomatous changes of the ileocecal region. Basically, the process centers around an initial inflammation with edema of either the appendix, the cecum or both. If the edema is sufficiently great to promote local, partial obstruction of the area, the secretory nature of the mucosal surfaces further enhances the tenseness of the involved structures and promotes the hard, indurated appearance.

In two of the cases presented, the appendix seemed to be the focal point of the surrounding inflammatory reaction. In the third and fourth cases, not only was the appendix involved but there was also a sinus tract between the periappendiceal mass and the cecum. The microscopic appearance of the excised tissues from all four

cases showed extensive fibrosis with marked scarring of all elements sectioned. There were unusually large amounts of inflammatory infiltrate made up of lymphocytes and plasma cells. No malignant changes were found in any of the sections of the primary masses or regional lymph nodes.

Report of Cases

Case 1.—This sixty-seven-year-old white woman was first seen on August 30, 1954. For four months, the patient had complained of constipation and intermittent pain in the right lower quadrant of the abdomen. She had lost 15 pounds of weight. There was no vomiting and no blood seen in the stools. Her past health was always good except for periodic bouts of constipation.

On physical examination there was a firm mass in the right lower quadrant which on bimanual vaginal examination was estimated to measure between 10 and 12 centimeters in diameter.

The hemoglobin was 11.8 grams, the red blood count 4,140,000, the white blood count 10,000. A differential white blood count revealed 77% segmented polymorphonuclear cells. The urine was negative to examination.

X-rays of the colon and terminal ileum, which the patient brought with her, showed the outline of the cecum to be more irregular than usual.

The diagnostic impression was carcinoma of the cecum, with appendiceal abscess also considered as a possibility.

The patient was admitted to the hospital and on September 3, 1954, abdominal exploration was carried out through a right vertical midrectus incision. A large mass was found to involve the cecum and appendiceal region and was attached firmly to the abdominal wall. So firmly was this attached that it was necessary to excise a portion of the peritoneum of the abdominal wall. This allowed mobilization of the mass and the right colon. A right colectomy was performed. An ileo-transversecolostomy was used to re-establish the continuity of the intestinal tract.

The postoperative course was uneventful and the patient was dismissed from the hospital ten days after surgery.

Pathological examination revealed a huge inflammatory mass surrounding the appendix with the latter structure showing subacute appendicitis.

Case 2.—A seventy-six-year-old white man was first seen on November 9, 1954. The chief complaint was a large mass in the right lower quadrant of the abdomen.

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This had been present for six months and was gradually enlarging. He had complained of alternating diarrhea and constipation for three weeks prior to entrance to the hospital and during this same time had complained of generalized abdominal cramps. Weakness and increasing anorexia had been noted for three months. He had lost thirty pounds over the six-month period.

Physical examination revealed a fairly well-preserved man of seventy-six years. The major findings were a very firm, irregular mass in the right lower quadrant of the abdomen, estimated to measure about 15 cm. in diameter, non-tender nodes in the right inguinal region, and mild tenderness on palpation of the mass. Rectal examination revealed a Grade II enlargement of the prostate with one stony, hard nodule palpable in the right lobe.

Laboratory examination revealed a hemoglobin of 12 grams, red blood count 4,290,000, white blood count 10,500. The differential white blood count revealed 77% polymorphonuclear cells.

X-ray of the colon revealed diverticulosis of the descending colon and sigmoid. The cecum did not fill well but showed no deformity.

The diagnostic impression was carcinoma of the cecum and the prostate.

On November 22, 1954, an exploratory laparotomy was performed. A large tumor, in the region of the cecum, was attached firmly to the anterior and lateral abdominal walls and the urinary bladder. The impression after examination and palpation of the mass was that it was malignant; therefore, a right colectomy, including the attached abdominal wall and a portion of the wall of the urinary bladder, was carried out. The urinary bladder was closed in layers and decompressed by means of a catheter brought out in the suprapubic region. The intestinal continuity was re-established by an end-to-end anastomosis of the ileum to the transverse colon.

The postoperative course of this patient was relatively uneventful, and he was released from the hospital on the twenty-second day following surgery. The pathologist reported a granulomatous process. The diagnosis was perityphlitis ligneum and pericecal granuloma.

About one month later, the patient was readmitted to the hospital complaining of abdominal pain, nausea and vomiting which had been present for three or four days. X-ray studies showed a gas-filled loop of small intestine. Subsequently, he was operated upon and a gangrenous loop of ileum was resected. The patient expired February 1, 1955, as a result of fistula formation and a terminal bronchopneumonia.

Case 3.—A thirty-year-old white man was first seen on October 15, 1956. The present complaint dated back to September 1, 1956, at which time he began to notice intermittent cramping pain in the right lower quadrant of the abdomen, not associated with nausea, vomiting or change of bowel habits.

The past history was only significant in that in August, 1956, he had infectious hepatitis. His recovery from this was rapid.

Physical examination revealed a 10 to 12 cm. hard,

somewhat tender, mass in the right lower quadrant of the abdomen. It was not movable.

Laboratory examination revealed a hemoglobin of 12.3 grams, RBC 4,180,000, WBC 7,650. A differential white blood count showed a normal distribution of white blood cells. Urinalysis was negative. Sedimentation rate was 24 mm./1 hr.

X-ray studies of the gastrointestinal tract were negative with the exception of the mass in the RLQ which prevented filling of the cecum with barium.

The diagnostic impression was appendiceal abscess or malignancy.

On October 22, 1956, an abdominal exploratory was performed. The large mass was found to involve the abdominal wall, the cecum, the urinary bladder and the sigmoid. The mass was very hard and firmly attached. A right colectomy, including the peritoneal attachments, and excision of a portion of the wall of the urinary bladder was accomplished. These attachments were so firm that they had to be divided with the scalpel. Intestinal continuity was re-established by side-to-side ileo-transverse colectomy. The postoperative course of this patient was uneventful and he left the hospital on November 13, 1956.

The pathological diagnosis was subacute suppurative appendicitis. There was an enormous periappendiceal chronic inflammatory mass with a sinus tract between the periappendiceal mass and the cecum.

These three cases are of particular interest because the preoperative impression strongly suggested malignancy of the cecum. In each case, the correct diagnosis was made only after right colectomy. It was only after the specimen was in the pathologist's hands that the true nature of the disease was realized.

Case 4.—A sixteen-year-old boy came to the clinic, June 4, 1957. His present illness dated back to March of 1957. The presenting complaints were: malaise, poor appetite, loss of weight, and occasional dizzy spells.

In March, he missed a few days of school because his stomach bothered him, and in mid-April he developed cough, anorexia, and fatigue. The cough improved after a week, but his complaint of fatigue persisted. His physician told him that he could have rheumatic fever. He was hospitalized from April 26 to May 4, and during that time he improved. A week or so after leaving the hospital, he noted a recurrence of his nausea, and he complained of increased warmth and light-headedness on standing.

Physical examination revealed a slight nasal congestion, a questionable enlargement of the spleen, a sedimentation rate of 20 mm/1 hr., and white blood count of 16,400. A differential white blood count revealed 65 per cent polymorphonuclears and 25 per cent lymphocytes. The urine showed 3 red blood cells per high-powered field.

He was hospitalized on June 10. The intern's diagnostic impressions were: (1) infectious mononucleosis, (2) rheumatic fever, (3) brucellosis. A chest x-ray examination gave negative findings. Heterophile test was reported negative. On June 12, he had an exacerbation of his illness, complaining of abdominal cramps,

vomiting and tenderness and muscle spasm on the right side of the abdomen. Surgical consultation was requested on June 13, and the diagnosis at this time was acute appendicitis walled off by omentum or a walled-off appendiceal abscess, and partial small bowel obstruction.

On June 14, he was operated upon under spinal anesthesia. A mass could be felt in the right side of the abdomen. A vertical incision was made over this area. Exploration revealed a moderately dilated ileum. There was a firm tumor mass involving the terminal ileum, cecum, and appendix. The distal inch of the appendix could be seen protruding from the mass. There was no pus seen. Our impression was that this represented a granuloma of some type although a lymphomatous tumor was also considered. A right colectomy was decided upon and carried out.

The pathologist reported a 9 x 6 x 10 cm. firm mass composed of lower ileum, cecum, appendix, and ascending colon. Upon opening the specimen, two superficial ulcerations were seen, one 2 cm. in diameter in the lower ileum and another 5 cm. long extending from the ileo-cecal valve into the cecum. This mass was made up of dense fibrous and fatty tissue in the center of which was the appendix. There were several fistulous tracks into this fibro-fatty mass filled with pus and communicating with the lumen of the appendix. The diagnosis was: organizing pericecal abscess originating as a subacute suppurative appendicitis with perforation.

The patient made an uneventful recovery and left the hospital on the eighth postoperative day.

Comment

The striking features noted at surgery in each case were the hardness and irregularity of the mass together with the very firm attachments to the abdominal wall and the urinary bladder and, in the third case, to the sigmoid.

Because of our experience and operative findings, we believe that right colectomy is the logical operative procedure. Local excision would seem impossible in view of the extensive and firm attachments. The end result of an ileo-transverse colostomy only is open to question.

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EFFECTS OF STIMULANT DRUGS ON REGRESSED PATIENTS

(Continued from Page 833)

Summary

Twelve of the most regressed men patients in an 1800-bed mental hospital were divided into three groups. One group received placebo; another group, Ritalin; and a third group, Wyamine for a period of two weeks. Dosages were minimal to begin with and were rapidly increased to relatively high levels. Behavior ratings were done, clinical observations were made and blood pressure and blood studies were carried out.

Conclusions

1. Systolic and diastolic blood pressures do not show a marked increase at relatively high dosages of Ritalin or Wyamine in regressed mental patients.

2. There was no difference in behavior noted in the small group of patients treated.

3. White blood count, red blood count and hemoglobin were relatively unaffected by the drugs given.

Acknowledgments

We are indebted to the Wyeth Laboratories for furnishing the Wyamine and placebo; to Ciba for the Ritalin; and to John Hamlon, M.D. and the Psychiatric Aides on the ward for various types of assistance.

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Constitutional Hepatic Dysfunction

An Unusual Cause of Jaundice in Childhood

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JAUNDICE at any age commands attention.

Its causes vary in kind and severity from infancy to adult life, and it generally has a serious connotation. Jaundice may be classified into three types: hemolytic, intrahepatic and extrahepatic. However, there is a benign kind of jaundice in which the indirect-reacting serum bilirubin is increased and which is not of serious nature and is compatible with reasonably good health. This condition is known by a variety of names and was first described in the early part of this century by Gilbert and associates¹ as simple familial cholemia. The name that best describes the condition, constitutional hepatic dysfunction, was suggested by Comfort² in 1935. Other names offered by various authors include simple chronic icterus, familial cholemia, familial nonhemolytic jaundice, and constitutional hyperbilirubinemia. Meulengracht³ described a similar condition as icterus intermittens juvenilis in 1939, and reviewed his experience in twenty-nine cases in 1947.⁴ Recently, Dubin and Johnson⁵ reported twelve cases of chronic idiopathic jaundice with an unidentified pigment in the hepatic cells; the condition they described differs substantially from constitutional hepatic dysfunction in that it is characterized by an increase of direct-reacting serum bilirubin. They had the advantage of biopsy of the liver in five of their patients. They were able to find only twenty-four cases in which biopsy of the liver had been reported in any of the above-mentioned conditions. They felt that several ill-defined types of jaundice were probably included such as familial nonhemolytic jaundice, the jaundice accompanying gastrointestinal diseases such as peptic ulcer, gastritis and colitis, and finally

jaundice resulting from the residue of viral hepatitis.

A paper by Rozendaal, Comfort and Snell⁶ in 1935 offers a clear-cut clinical picture of the condition known as constitutional hepatic dysfunction and cites the prior publication on the subject by Gilbert and associates. Rozendaal and co-workers studied 214 patients seen at the Mayo Clinic in the year 1930-1931 in whom the concentration of serum bilirubin was increased to values ranging from 2 mg. up to 7 mg. per 100 cc. of blood. Clinical jaundice usually appears at a concentration of 3 mg. per 100 cc. Normally there is a balance between the formation of bilirubin by the reticuloendothelial cells of the liver and its excretion by the hepatic cells. This balance is upset by disease which increases the formation or decreases the excretion of bilirubin. Constitutional hepatic dysfunction is presumed to be due to an inborn defect of the hepatic cells in the excretion of bilirubin, that is, to a high threshold of excretion. Consequently examination of the blood discloses an increase of indirect-reacting serum bilirubin without other evidence of hemolytic disease such as spherocytosis, splenomegaly, increased fragility of the red cells, reticulocytosis or increased activity of the bone marrow, which are found in congenital hemolytic jaundice.

The jaundice may be familial and may begin in early childhood. Males are affected predominantly. It may be constant or intermittent and has a tendency to appear or increase following emotional upsets, bilious or migraine attacks, or with constipation or diarrhea. In some instances there is evidence of previous hepatic disease or injury. There are usually no symptoms except fatigue and asthenia associated with the jaundice, and these do not adversely affect the health of the patient. The only abnormal laboratory finding is an increase of indirect-reacting serum bilirubin. The liver and spleen are not enlarged. The jaundice is usually mild or it may be latent.

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Constitutional hepatic dysfunction may be confused with hemolytic disease, as well as diseases of the biliary tract and liver. This may lead to unnecessary restrictions on the patient and unnecessary surgical and medical procedures. There is no reason for splenectomy, cholecystectomy or choledochostomy. No benefit results from medical treatment for hepatitis or cirrhosis of the liver. The presence of this disorder should not deny the patient the right to be insured. It is entirely possible that cholecystic disease may be found in some of these patients as they progress and they should be observed for this condition.

As constitutional hepatic dysfunction has received scant attention in pediatric literature, it seems advisable to call it to the notice of those who deal with children in order to emphasize its benign nature. The following case illustrates the condition.

Report of Case

A five-year-old adopted boy had been in good health until the age of three years when it was first observed that he had jaundice accompanying acute infection of the respiratory tract. The yellow color of his skin at that time was attributed to carotinemia. Further tests were done because he had fever and nausea and was ill for a month. Infectious hepatitis was diagnosed, and hepatomegaly noted. He became well until a year later when his jaundice returned with fever and nausea, and his liver again showed some enlargement. He had pneumonia with this attack, was hospitalized for one week, and then remained home in bed for two months with jaundice and continued enlargement of his liver. Thereafter he had recurrent episodes of jaundice associated with sore throat. A short time before he was brought to the Mayo Clinic he had been hospitalized for the same condition and a diagnosis of infectious mononucleosis with associated hepatitis had been made. He had received various antibiotics, vitamin K, liver extract and a low-fat, high-caloric diet and his activity had been restricted. He had been kept out of school. His stools had been of normal color but his urine had been darker at times when he had jaundice. The boy denied feeling tired or listless when jaundiced.

On admission at five years and ten months of age the boy appeared to be well developed and well nourished. He had a slightly yellow color of his skin and sclerae. His temperature was 99° F. orally, his blood pressure 98 mm. of mercury systolic and 60 diastolic and his pulse rate 100 beats per minute. Examination of his ears, nose and throat gave negative results. His tonsils were small. His heart and lungs were normal. The edge of the liver was at the right costal border. His spleen was not palpable.

The urine had a specific gravity of 1.024, it was acid, and it contained no albumin, sugar or bile. Micro-

scopic examination of the sediment showed no abnormalities. A 24-hour collection of urine contained 0.66 mg. of urobilinogen. The hemoglobin content was 12.8 gm. per 100 cc. of blood. The erythrocytes numbered 4,140,000 and the leukocytes 5,700 per cubic millimeter, of which 36.5 per cent were lymphocytes, 4 per cent monocytes, 58 per cent neutrophils, 0.5 per cent eosinophils and 1.0 per cent basophils. The reticulocytes represented 0.7 per cent of the cells. The sedimentation rate by the Westergren method was 5 mm. in 1 hour. Blood smears were not diagnostic. No spherocytes were noted. In the fragility test, hemolysis of the red cells commenced in a 0.44 per cent salt solution and was complete in a 0.28 per cent solution. A Coombs anti-globulin test gave negative results. Serum bilirubin determinations were negative by the direct method and gave values of 3.65 and 3.84 mg. per 100 cc. by the indirect method. The prothrombin time was 17 seconds. The sulfobromophthalein-retention test gave negative results. The zinc sulfate turbidity test gave a value of 9 units and the cephalin cholesterol flocculation reaction was negative. X-ray examination of the thorax gave negative results as did the tuberculin test with single-strength purified protein derivative. Serum electrophoresis showed a total protein content of 6.5 gm. per 100 cc., made up of the following fractions: albumin, 3.90 gm.; alpha globulin, 0.25 gm.; alpha₂ globulin, 0.63 gm.; beta globulin, 0.82 gm.; and gamma globulin, 0.90 gm.

The history and findings fitted the description of constitutional hepatic dysfunction as outlined by Comfort in 1935. The parents of the boy were reassured about the benign nature of the disorder, all restrictions of diet and exercise were removed and no medication was suggested. The hematologist could find no evidence of a hemolytic type of jaundice. Follow-up information since the boy's dismissal indicates that he is in excellent health. His jaundice has recurred but he has continued all his normal activities.

Summary

Constitutional hepatic dysfunction is a benign condition characterized by intermittent jaundice due to increase of indirect-reacting serum bilirubin. It is presumably due to an inherent defect in the hepatic cell in which the threshold for excretion of indirect-reacting bilirubin is raised. Patients with this condition would be spared needless operations and medical treatment if it were correctly diagnosed and the hopeful outlook appreciated.

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(Continued on Page 846)

Infertility—A Family Unit Problem

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THERE is no problem of more innate concern to the family unit than the basic distress of a barren marriage. The mature female's sense of fulfillment, derived only from a growing family, is replaced by unbelievable levels of immature pettiness or self-pity. The fundamental male demand to protect and provide is dissipated by lack of dependency. In essence, an involuntary barren marriage is built on the psychological sand of unit frustration, rather than the rock of family cohesiveness and growth.

Any approach to the problem of the infertile family unit must be divided into two definitive categories. Of primary importance, is the dissemination of fundamental conceptive information. Of equal import, yet of secondary consideration, is the demand for infinite detail in the infertility work-up. The most efficient organization of a patient's and physician's time is required to deal with the need of disseminating definitive medical information, and subjecting the infertile unit to the infinite detail of a well-planned sterility work-up.

All couples seen by the Infertility Service of the Washington University School of Medicine are treated on a purely private patient basis. These family units must, however, volunteer complete cooperation of both husband and wife for at least a year from the onset of definitive medical evaluation. The necessity of treating the infertile couple as a single biological unit has long been well recognized.¹ It probably matters little which medical discipline undertakes to treat the infertile family unit. However, it is of major import to hold this unit closely together. Early rapport, established between investigator and unit members, is of inestimable value in relieving the basic tensions inevitably associated with the exhaustive investigative procedures necessary for any complete evaluation of an infertility problem.

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The Intake Interview

Certainly the most universally neglected, yet the most rewarding practice associated with infertility investigation, is an initial informal interview with both members of the family unit. This appointment should be arranged outside of regular office hours, because the interview usually takes a minimum of an hour's time. The interviewer must place the couple at ease at the outset of the discussion. As a possible introductory wedge, one might mention the high incidence of sterility (one infertile couple in every eight marriages).² It is of real psychological import to bring the family unit to realize that they comprise no medical oddity, but are, indeed, involved in an unfortunately all-too-common situation.

The first step in the intake interview is a detailed discussion of the basic essentials of reproduction, as they apply to the individual family unit.³ Of course, it is of primary importance for the infertile couple to know when to have intercourse (in relation to the theoretical ovulation time). Certainly, the optimum intercourse frequency (to maintain best possible sperm production) must be described. The most effective unit positioning in intercourse (to develop the best anatomical chance of conception) should be mentioned and defined in detail. A lead discussion to this detailed sex talk is provided by a complete explanation of the basic physiology of the human genital system, and a detailed account of the phenomenon of conception. In essence, the physician should presume that the average infertile family unit does not know where babies come from, and must present the true story in complete and frank detail. Rapport established during this sex talk will be of a major aid during the tension-filled phases of any subsequent infertility work-up.

In addition to the advantage of establishing rapport with the infertile family unit, a detailed discussion of how, when and how frequently it is best to have intercourse will be infinitely rewarding in terms of pregnancy accomplished.

Over an eight-year period, one out of every eight couples who, so far as they knew, had never previously conceived, were able to accomplish conception within a three-month period following the basic, detailed sex discussion.⁴

It is also important during the intake interview to describe the steps to be taken in carrying out a complete infertility evaluation in the event the family unit is unable to conceive during the subsequent three-month trial period. Once an infertile unit has been presented with a complete plan of investigative action, their cooperation increases by leaps and bounds. It is also certain that unit confidence developed under the guise of feeling "something is being done," will relieve a great deal of the marital tension constantly noted in the female partner. Possibly, many of the women who conceive subsequent to the basic sex talk do so as much from tension relief, as from putting into practice the basic information of how, when, and how frequently to have intercourse.

If the infertile unit is unsuccessful in achieving conception in a three-month trial period subsequent to the intake interview, they have only to notify us of the initial day of any menstrual period in order to start the complete clinical and laboratory infertility evaluation. Also they are instructed to have intercourse as the period is expected or has just started, so that the male partner may be evaluated (with not less than three nor more than five days of continence)⁵ during his wife's menstrual period. This provides the opportunity of evaluating the male at the height of his reproductive prowess, rather than with a too little or too long period of continence, before sperm specimen evaluation. Thus, the male member of the family unit is always the first to be checked.

There are several advantages in conducting the investigation of the male partner before that of his female counterpart. In the first place, it must be presumed that he represents 50% of the bargain. Second, it is obviously infinitely easier to do a complete evaluation of the male than the female marital partner. Finally, it has certainly been true in the past, that many males have confused a suggestion of infertility with a suggestion of impotence. Subsequently, they have refused adequate and effective cooperation with the examiners. The distinction between the infertile and impotent male is completely defined for both hus-

band's and wife's edification during the original intake interview.

Work-up Routine of the Male Partner

The initial procedures of the primary evaluation are (in order): The laboratory determination of a basal metabolic rate, blood count, urinalysis, roentgenogram of chest; subsequently followed by a complete history and physical examination. In taking the history, such salient factors as the following are discussed and recorded: Age; length of marriage; period of contraception (if any); previous marriages and resulting pregnancies; positioning, frequency or difficulties during coitus; childhood disease (especially mumps with resultant complications), other serious illnesses, operations, venereal disease or general infections; possible radiation exposure; recent marked change in weight; injuries; occupation; diet; drug and alcohol ingestion; and tobacco consumption. This detailed history is followed by a complete physical examination with, of course, emphasis on the lower abdomen, the genitals and the prostate gland. Finally, a sperm specimen is collected for laboratory examination.

Technique

Sperm can be obtained from the human male in at least five different ways. However, only one of these techniques is considered significantly informative to be used by the Infertility Service, (Masturbation Technique).

Withdrawal Technique.—The family unit has intercourse, and as the male feels the ejaculation imminent, he withdraws, and collects the specimen in a clean container. The difficulties involved with this technique are significant. The male frequently loses a few drops of the ejaculate. Since the major sperm concentration is in the first quarter of the male ejaculate, this technique may well result in medical misinformation.

Condom Specimen.—For this technique, intercourse is carried to completion and the ejaculate delivered for laboratory analysis. The difficulties with this technique are of even more concern than the withdrawal technique. It is impossible for the male to remove the condom successfully without a part of the ejaculate remaining on the shaft of the penis. Certainly, the examiner can-

not remove all the ejaculate from the condom. Moreover, both the rubber and the talcum frequently associated with commercially marketed condoms are spermicidal. Thus this technique also is fraught with the possibilities of false information.

Hühner Technique.—In this instance, after the couple has intercourse, the wife visits the physician a few hours after coitus for an aspiration of the cervical mucus. This technique, in company with both the above methods, will certainly demonstrate major discrepancies in sperm production, and will also describe immediate sperm motility. If dead sperm are found in cervical mucus, however, this technique does not delineate between the possibility of the sperm being ejaculated dead and the possible antipathy to these particular sperm by the marital partner's cervical mucus.

Prostatic Massage.—Rectal massage of the prostate will certainly provide sufficient material for a sperm count. Since the first few drops of the ejaculate are effectively obtained by this technique, it is used by many examiners as a quick office procedure technique. Despite the clinical ease with which this technique is carried out, it should be noted that one of the least important factors in the evaluation of the male's sperm specimen is the actual sperm count.

Masturbation Technique.—This is the only technique acceptable to the Infertility Service, when the responsibility of defining male fertility is at stake. The entire ejaculate may be easily obtained, under relatively sterile conditions. Once satisfactorily obtained, the complete sperm specimen is evaluated in detail over a twenty-four hour period.

The semen specimen is allowed to liquefy before a culture is taken. Analysis is then performed following essentially the criteria offered by Falk and Kaufman.⁶ Evaluation is made according to total volume, viscosity, turbidity, count per unit volume, total count, initial motility and morphology.⁷⁻¹⁶ Finally, and most important, subsequent sperm motility is defined throughout a twenty-four hour observation period. Certainly, the greatest investigative emphasis is placed on sperm motility and sperm longevity. Most observers today consider these factors as the most important definitives of semen quality. It matters

little how high the initial sperm count is, if adequate numbers of normal appearing sperm do not live for a sufficient time, and swim effectively enough to reach the ampulla portion of the fallopian tubes, where fertilization actually occurs. Without these two characteristics of adequate motility and longevity (eighteen to twenty-four hours *in vitro*) demonstrable in a sperm specimen, the individual male is considered sterile. When white blood cells are noted during the initial sperm count, the sterile specimen is cultured. If either coliform or anaerobic streptococci are found, the individual male is treated by the appropriate antibiotic compound.¹⁷

Routine Examination of the Female Partner

If the male is not completely defined as sterile, the female is then studied. The initial investigation of the male partner is usually completed by the fifth or six day of the individual menstrual cycle under analysis. The wife is seen alone on the sixth or seventh day of this first cycle of study. If one can move directly from evaluating the male to evaluating the female partner, continuity is established, and the sense that "something is being done" is brought afresh to the couple's consciousness. The press of previous medical commitments, too often delays the work-up of either partner. The initial enthusiasm engendered by the intake interview is dissipated. Once lost, such enthusiasm is hard to recreate.

A complete history is taken with deliberate repetition of certain points in the husband's history. The following pertinent points are discussed: Previous professional advice, including intercourse timing; frequency and positioning; difficulties of coitus; menstrual history; period of present marriage; period of contraception; period of pregnancy trial; history of previous marriage and resultant pregnancies; temperature charts results; childhood diseases; serious illnesses; operations; pelvis infection; venereal diseases; radiation exposure; recent marked change in weight; injuries; occupation; diet; drug and alcohol ingestion; and tobacco consumption. A thorough physical examination is then completed with particular attention directed toward careful examination of the pelvis.

The patient is instructed in the technique of taking daily vaginal smears throughout the investigative menstrual cycle. Smears are taken at

approximately the same time every day, except during the presumptive ovulatory phase. During this week, slides are taken twice a day, at twelve-hour intervals. Since correlative studies are being conducted in all cases with basal temperature variations, the patient is given a prepared chart for recording temperatures, and is taught to take daily, basal, rectal temperatures. The value of both vaginal smears and basal temperature changes as possible ovulatory indices is explained to the patient.

Within the next five days, the female partner is seen for physical and laboratory evaluation. First, she is exposed to a laboratory schedule involving a basal metabolic rate, complete blood count, urinalysis and roentgenogram of her chest. Hysterosalpingography is also scheduled, the time chosen to fall between the end of the menses, and the presumptive ovulation date. This timing obviates the possibility of extrusion of loose endometrial tissue into the peritoneal cavity, or embolism of dye through an open uterine sinus. At the same time, it makes the disturbance of a possible conception highly improbable. There is also the incidental chance, according to numerous reports in the literature, that conception may follow directly in the wake of this test for tubal patency.¹⁸

Immediately prior to the actual dye injection, a culture is taken of the cervical mucus, again in an attempt to describe either coliform or anaerobic streptococcal organisms.¹⁹ If positive cultures are returned, the cervix and cervical canal are directly injected with streptomycin, and the cervical mucus recultured the next month. Occasionally, it requires several such injections to free the cervical mucus of these pathogens. It is impossible to achieve bacteriocidal levels of the antibiotic compound in the depths of the infected cervical glands by the usual technique of parenteral injection.

Finally, routine technique is employed in hysterosalpingography. Fundamentally, this clinic has employed aqueous radiopaque media. The salpingogram is usually done on an outpatient basis. If necessary, antispasmodics or sedatives are given to further the effectiveness of the examination by relieving patient tensions or distress. When the procedure is completed, the wet films are shown to the patient, and explained in detail.

It is important not to waste the possibilities of pregnancy during this first investigative cycle. Ac-

cordingly, from menstrual history alone, the patient is given an arbitrary fertility schedule. Intercourse is scheduled three times at thirty-six-hour intervals, preceded by a three-day period of abstinence.⁵ The schedule is estimated on the basis of the fairly well-accepted fact that ovulation occurs generally fourteen days, plus or minus two days, before the onset of menses.²⁰

The initial work-up of the female is finished at the end of the first complete menstrual cycle with an endometrial biopsy. A Novak²¹ suction curette is used for this. The biopsy is performed within the first few hours after the onset of the menses. It is never performed before the onset of the menses, for fear of the remote but ever-present possibility of disturbing a pregnancy, although it is recognized that menstruation causes a variable degree of loss of morphologic detail. However, the endometrial tissue certainly may be evaluated broadly, if taken within the first three or four hours after the onset of menstrual flow.^{22,23}

At the time of this third and last visit of the wife during the first menstrual month, she presents her vaginal smears taken during the entire cycle. These are stained by the Shorr technique²⁴ and later studied in detail.²⁵ At the next visit, the stained smears are demonstrated and explained to the patient in correlation with the endometrial biopsy sections, temperature chart, and results of the routine laboratory evaluation.

The detail just described represents the initial month's effort with the infertile family unit. Obviously, it is anticipated that the material and information turned up in the first month will determine the course of subsequent definitive investigative procedures.

Fundamentally, four types of sterility problems are encountered in infertility research. In order of frequency, they are: First, the couple which, as far as they know, has never conceived. Second, the couple who rather frequently conceive, with consequent regular abortion. Third, the couple who become sterile after one pregnancy. This family unit describes little or no difficulty in attaining its first conception, but thereafter is unable to achieve a second pregnancy. Fourth, [and finally] (a combination of the second and third), the one-pregnancy couple which, with subsequent conceptions, join the multiple-aborter group.

The handling of each of these problems represents differences in technique; in investigative ap-

proach; and in corrective therapy. Suffice it to say, that an infertility investigation cannot be successfully accomplished without a complete evaluation of the family unit proper, following in general the fundamental techniques described in this paper. Without the basic organization of the initial interview and the detailed initial screening work-up, sufficient information cannot be obtained to tackle successfully any of the four groupings of infertility problems. The rapport established by taking the family unit through a well-organized investigative menstrual cycle, is easily carried over into a more definitive evaluation of the family unit, regardless of which of the investigative groups they join.

It cannot be emphasized too strongly that the mutually stimulative and encouraging aspects of the family unit working together toward the ultimate solution of their common problem is of major importance. This emphasis on co-operative endeavor achieves the family-unit continuity of effort so necessary for the successful termination of any detailed infertility evaluation.

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CONSTITUTIONAL HEPATIC DYSFUNCTION

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Massive Recurring Bleeding in Regional Enteritis

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OCCULT bleeding from the bowel can be a most perplexing diagnostic problem. When the bleeding is massive and recurrent, the difficulties are multiplied. Even when the cause of the bleeding is discovered, it may not be possible, for a number of complicating factors, to treat it satisfactorily.

Report of Case

History.—The patient whom I wish to present to you is a man, thirty-one years old, who came to our clinic on May 3, 1957. He gave a history of having had recurring hemorrhages from the intestines for two and one-half years. He said he never had vomited blood, but that he would experience a sense of weakness and exhaustion and the urge to defecate, at which time he would pass dark red-to-black, tarry stools. He had no intervening intestinal disturbance at any time. He was not subject to diarrhea or constipation. The only episode of diarrhea in the previous two years which he could recall was an episode which followed the spraying of his trees with an insecticide. He gave no history of anything of significance other than these periodic passings of blood.

The patient is a large, heavy man. In fact, he was heavy at the age of twelve years. In 1953, he weighed 350 pounds, and his height was 5 feet, 11 inches. In that year he had had a curious type of dysphagia, and he decided that he should lose weight. He curtailed his eating so that he did reduce his weight to 255 pounds.

In December, 1954, about the time that the first baby was due to be born to his wife, the patient became very nervous and agitated. At that time he first noted the passage of a black, tarry stool. He had felt no pain, but noted that his pulse was rapid. He was sufficiently prostrated for his family to have him placed in the hospital. A roentgenogram of the stomach disclosed nothing abnormal. Anemia was found. Because of bleeding and the anemia, it was suggested that he might have a duodenal ulcer. A regime for the treatment of ulcer was prescribed for him.

In February, 1955, he passed a series of black-to-reddish-black stools over a period of three days. There-

after, each month for the next several months, there would be a period of one, two or three days in which he would pass black, tarry stools. Studies made in June of 1955 disclosed nothing, and again it was suggested that the patient had a duodenal ulcer, even though an ulcer could not be visualized.

Prior to coming here, the patient had had an episode of bleeding on April 15, 1957. At that time he had lost a quantity of blood sufficient to require the administration of 5 units of blood. Results of various investigations, including roentgenologic examination of the stomach and of the colon (after a barium enema), were negative. He was strongly urged at that time to undergo an exploratory operation.

Clinical and Laboratory Studies.—At the time of the initial physical examination of this patient at the Mayo Clinic he weighed 255 pounds. He looked pale. Other than the excessive weight, nothing abnormal was noted during the physical examination. The value for hemoglobin was 7.9 gm. per 100 cc. of blood, the erythrocyte count was 4,200,000 and leukocyte count 6,000 per cubic millimeter of blood. The bromsulphalein test of hepatic function showed no evidence of retention of dye. The blood group was O, Rh and the factor was positive. Gastric analysis revealed total acids of 32 and free acids of 32. Results of all roentgenologic studies were entirely normal; these studies included a roentgenogram of the stomach, x-ray, roentgenograms of the colon after a barium enema, and a series of roentgenograms of the small bowel.

The patient was seen in consultation by Dr. B. Marden Black, of our section of general surgery. In view of the fact that the patient had sustained at least eighteen definite hemorrhages from the bowel during two and one-half years, and another hemorrhage about three weeks prior to coming to the clinic, plus the persistence of the previously noted anemia, with a value for hemoglobin of 7.9 gm. per 100 cc., we advised the patient to accept operation in the hope that the source of the hemorrhages could be found. In the face of the repeatedly negative results of the various studies carried out, the cause of the bleeding of this patient could only be speculated upon. He agreed to the exploratory operation, and preoperatively he received 1,000 cc. of blood. The usual preparation of the bowel was done.

Surgical Observations.—On May 13, 1957, operation was performed, at which time it was found that a segment of approximately 200 cm. of the lower part of the ileum was involved by skip areas of regional enteritis.

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The lowest lesion was about 15 cm. above the ileocecal valve, and above that site were multitudes of skip lesions, scattered throughout the ascending 200 cm. of bowel. Above the sector involved by enteritis the small bowel felt normal. The stomach seemed to be normal. There was no evidence of any abnormality in the colon.

Postoperative Measures.—In view of the weight of the patient and the extent of the disease, it did not seem wise to carry out an operation involving resection of more than 200 cm. of intestine. Hence, since resection was not feasible, it was advised that he receive the benefit of roentgen-ray treatments, which would consist of irradiation of the four quadrants of the abdomen on successive days. This course was to be repeated at intervals of four or five weeks for a series of three courses. The patient was unable to remain here, and said he would undergo these roentgen-ray treatments in his home city.

I received a telephone call from the patient's wife during the latter part of July of this year; she said her husband was in the hospital again after another hemorrhage. He had sustained two hemorrhages since he left the clinic, but the one for which he had been hospitalized was severe. Blood had been administered to him three times by noon of the day on which his wife called me. She wanted to know what could be done. She said her husband had received only one course of the three courses of roentgen-ray treatments which we had advised. I told her I thought that he should complete the other two courses of roentgen-ray treatments as soon as possible. I said that if bleeding should still continue, we might have to attempt resection, on the basis that the risk of resection would be less than the hazard of bleeding to death. It was a difficult decision to make, whichever way it went.

Comment

The purpose of this report is not so much to discuss regional enteritis as to present an illustration of severe intestinal bleeding, the cause of which cannot be recognized by our usual methods. When we think of causes of intestinal bleeding, in about 70 per cent of cases we are likely to regard such bleeding as arising from a peptic ulcer. In possibly 15 to 20 per cent of cases this type of bleeding may proceed from disease of the liver, and in the remaining cases it is caused by a heterogeneous assortment of such conditions as Meckel's diverticulum, solitary ileal ulcer, hereditary telangiectasia and leiomyomas—to mention a few.

So far as regional enteritis is concerned, it is fortunately a rare disease. In our experience, regional enteritis occurs about once to every ten instances of ulcerative colitis. Furthermore, of 600 patients with regional enteritis studied by Van Patter,¹ thirty-six (6 per cent) had sustained fairly severe intestinal bleeding, although I would say that the patient in our report certainly experienced hemorrhage as severe as any I have ever heard of. Actually, the incidence of 6 per cent for severe melena, just mentioned, is not too much higher than the incidence of bleeding in the presence of peptic ulcer. Of course, hemorrhage from any source is a frightening and dramatic symptom.

Hence, when a patient experiences recurring episodes of hemorrhage for which no cause can be discovered, the bleeding is a particularly great problem. In the patient whom I have described, resection of the 200 cm. of involved ileum may yet have to be done, lest the patient die of hemorrhage. However, as I pointed out, because of the extent of the disease and the excess weight of the patient, resection did not seem the proper procedure at the time we saw him. As to whether roentgen-ray therapy will control the process, we do not know. In our experience with patients for whom resection is not indicated, 20 to 25 per cent of them will derive definite benefit from irradiation therapy. On the other hand, in an occasional case, irradiation may even cause or increase bleeding, so that the physician must be alert to such a possibility.

We have urged this particular patient to maintain a high intake of proteins but to curtail calories in an effort to bring about loss of another 50 pounds. If this reduction is achieved, and if bleeding persists after the prescribed courses of roentgen-ray treatment have been completed, then resection surely will be attempted.

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Fractures and Dislocations of the Hand and Fingers

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WHILE all of the joints of the upper extremity are important, an injury to any one of them can be fraught with danger. The most critical are those of the fingers and thumb. This is particularly true with respect to the thumb, index, long and ring fingers. The little finger is useful but one can get along without it. Loss of motion of any of the joints of the fingers can be of great economic importance. It is sometimes difficult to avoid this complication, and everything should be done to maintain and regain motion of the joints. The injured finger or fingers should be immobilized, but not the uninjured members. By immobilizing the injured finger, whether it be a sprain, fracture or dislocation, the torn structures are allowed to heal and traumatic exudation is allowed to subside with consequent better chance of recovery of motion. With the injured finger at rest, pain subsides and the other fingers are free to move. If the injured finger is not immobilized, it is painful and causes inhibition of motion of the other fingers which subsequently might become stiff because of the lack of active use.

The practice of immobilizing a finger in the straight position on a flat strip of metal or wooden tongue blade is dangerous, because capsular contraction and dense adhesion formation might occur. This is particularly true at the metacarpal phalangeal joint. A fracture of the phalanx held in the straight position usually increases displacement of the fracture. Further, the other uninjured fingers then cannot move freely in flexion. Active exercises of the uninjured fingers must be carried out, accomplishing full extension and full flexion. The patient must cooperate in these exercises and regain use of the finger with his own power. Passive exercises of

the fingers are to be avoided. If a joint that is tending to become stiff is treated with passive exercises, it likely will tend to become even more stiff because of increase in traumatic exudation with subsequent adhesion formation. Fractures in the hand and fingers should be reduced as accurately as possible. This is particularly true in fractures of the phalanges. Inadequate reduction of fractured phalanges will hinder free movement of the flexor tendons. Fractures of the phalanges usually have forward angulation and, if this is not corrected, there will be a corresponding limitation of motion of flexion due to bony prominence which sometimes will cause permanent stiffness. This is especially true where there is subluxation of a joint that remains uncorrected. The danger of redisplacement of fractures, dislocations or subluxations must be recognized and corrected immediately.

In compound injuries of the fingers, immediate operation must be carried out with thorough debridement of the devitalized soft tissue. Viable skin flaps are replaced and sutured without tension. If there is any question of swelling of the finger, it is better to maintain apposition of the skin edges by bandaging alone. The finger is not constructed to allow for a great deal of post-traumatic swelling. Severed tendons should be sutured if there is no danger of infection. If there is any question, tendon repair can be carried out at a later date after the wounds have healed. It is advisable not to use catgut, since it may act as a foreign body. In an adult where a finger is severely crushed and injured and permanent stiffness appears likely, early amputation is advisable, as this allows for active mobilization of the remaining fingers. In a child where there is more power of regeneration, conservative therapy of a badly traumatized or injured finger is sometimes justified. At no time should a thumb be amputated; it is much better to have a stiff

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thumb against which the fingers can oppose and carry out the grasping function of the hand. Any kind of a thumb, even though it is stiff, is better than no thumb at all. If there has been severe trauma to the skin, one can treat the thumb by the Orr method of immobilization in a plaster dressing with the thumb held in the opposed position. Later, when healthy granulation tissue has developed, skin grafting can be carried out. Another method which can be utilized is that of burying the thumb in a skin flap of the abdomen. The one objection to this is that it does hinder the mobilization of the fingers. In one case that I am aware of, the thumb had been completely severed at the metacarpal phalangeal joint. It was brought in along with the patient. The plastic surgeon* placed it in the abdomen and later transferred it by skin graft and fusion to the distal thumb metacarpal and the patient now is most fortunate and pleased to have a thumb even though stiff. For cosmetic reasons he is most appreciative.

Fractures of the Shafts of the Metacarpals

Care should be taken to avoid excessive immobilization of these fractures. The fingers should be left free so that, no matter what type of bandage or splinting is utilized, active use of the fingers and thumb can be carried out. As in the case of the ribs which are anchored by the intercostal muscles, the shafts of the metacarpals are anchored by the fascia and interosseous muscles. Consequently, very little displacement is apt to occur. Spiral fractures of the shafts of the metacarpal usually can be treated with a dorsal plaster dressing running from the metacarpal phalangeal joints to the upper forearm with the hand firmly strapped. Occasionally, difficulty is encountered in transverse fractures of the metacarpal bones with marked displacement, especially in the case of the index and little fingers. Sustained traction plus volarward pressure on the distal fragment usually will overcome the overriding and backward angulation. If this does not permit satisfactory reduction, one should then carry out an open reduction and impact the fracture fragments. If necessary, internal fixation with an intramedullary Kirschner wire or cross fixation into adjacent metacarpals can be utilized.

*Grotting, John: Personal communication.

Fractures of the Neck of the Metacarpals

This fracture which is frequently termed "Saturday night fracture" is a common fracture and occurs most frequently in the little finger metacarpal bone and to a lesser extent in the index finger metacarpal bone. If satisfactory reduction is not accomplished, rather serious disability may occur. It is a mistake to treat this fracture with the finger in the straight or hyperextended position, as this will tend to increase the forward tilt of the head of the metacarpal towards the palm. Further, in these positions the capsule and lateral ligaments are relaxed, inviting contracture and serious stiffness. The fracture is reduced by flexing the metacarpal phalangeal joint and the proximal interphalangeal joint to a right angle, and, with the middle finger holding the proximal fragment, pressure is applied with the thumb on the flexed proximal interphalangeal joint in the backward direction. Then a posterior plaster dressing is applied from the upper forearm to the fracture site, while reduction is being maintained as outlined above. Next, a narrow plaster splint is applied from the tip of the finger over the extensor surface of the finger joining the splint. Care should be taken to place adequate padding over the proximal interphalangeal joint so as to avoid excessive pressure, which sometimes can result in pressure necrosis of the skin and subcutaneous tissue. Immobilization is carried out for a period of three weeks. During this time the other fingers and thumb are free to carry out active exercises. An alternative method would be to run an intramedullary Kirschner wire through the distal fragment into the proximal fragment after this fracture has been reduced. This method even allows for some motion of the involved finger in addition to the other fingers. This wire is removed after three weeks. In regaining motion, passive stretching should be avoided.

Fractures of the Phalanges

These fractures occur frequently and most commonly in the proximal phalanx. The typical displacement is that of anterior angulation due to the pull of the lumbrical and interosseous muscles which run from the flexor side of the metacarpals to the extensor aspect of the proximal phalanx distally, thus causing flexion of the proximal fragment and extension of the distal fragment. In order to obtain reduction, the finger

is put up in the flexed position. This can be done over a one-inch gauze roll held with adhesive strapping or by utilizing a malleable splint reinforced with a forearm plaster dressing. Or the finger can be immobilized in the flexed position with a carefully molded finger plaster dressing. These dressings have to be watched carefully for any possible loosening with resultant slipping of the fracture fragments. Unstable fractures of the phalanges or unstable fractures involving a joint should be treated with the finger in the flexed position, utilizing pulp traction or skeletal traction to the distal phalanx carried to the volar aspect of the wrist incorporated in a short arm plaster dressing. In lining up the finger, rotational deformity can be avoided if the tip of the finger points toward the tubercle of the navicular bone (toward the base of the thenar eminence).

Sprains

Sprains of a metacarpal phalangeal joint or interphalangeal joint can cause a great deal of concern and sometimes will give symptoms over a long period of time. The involved joint is painful and swollen. X-rays may show small chip fractures. Sometimes an actual dislocation at the time of the injury occurs, with spontaneous reduction and tear of the lateral ligaments and of the capsule. The involved joint should be immobilized for two weeks with firm adhesive strapping or collodion gauze dressing. The patient should be warned that persistent swelling and stiffness of the joint may last for several weeks. Active exercises are utilized in regaining motion. During the period of immobilization the involved joint is bandaged in slight flexion.

Dislocations

Dislocation of a metacarpal phalangeal joint or of an interphalangeal joint usually results from hyperextension of the phalanx and strain causes it to displace backwards. Reduction usually can be accomplished by traction followed by flexion. In some cases, reduction is not accomplished by closed manipulation. This is because the head of the metacarpal becomes buttonholed through a vertical slit in the capsule which closes in on the neck of the bone. One should not hesitate to carry out an open reduction through a lateral incision. The flexor tendons are retracted, the tight bands of capsule are divided, and the dislocated phalanx is pushed forward into its nor-

mal position. In both closed and operative reduction, the involved finger is immobilized for three weeks in the flexed position.

Drop Finger or Mallet Finger

This subcutaneous tendon injury resulting in avulsion of the extensor tendon at its insertion in the terminal phalanx is commonly called "baseball finger" because of its frequent occurrence among baseball players. Power of extension over the distal joint is lost. The injury occurs while the extensor tendon is actively contracting and the finger at the distal joint is forcibly flexed. A secondary deformity may occur with hyperextension at the mid joint. The extensor tendon has two lateral slips which form over the basal phalanx and terminate at the distal joint. A central slip of the extensor tendon inserts at the proximal portion of the mid phalanx and extends the mid joint. With avulsion of the extensor tendon at the terminal joint, the extensor tendon retracts and increases the power of the central slip to extend the mid joint, resulting in hyperextension of this joint. The principle of treatment is the same whether the tendon alone has avulsed, whether it has avulsed along with a fragment of bone or, in children, avulsed along with the epiphysis at the base of the phalanx. It is that of hyperextending the distal joint and flexing the mid joint which allows for reapproximation of the avulsed tendon to its normal site of insertion. With the finger held in this position, a well-molded plaster dressing or malleable metal splint is applied. Continued immobilization should be carried out for six to eight weeks in recent cases. In old cases of several weeks' duration, the same treatment should be carried out, but immobilization should be continued for eight to ten weeks. Operative repair of this injury can be carried out, but conservative therapy is the procedure of choice. The danger of breaking down of the skin and development of a possible draining sinus, because of the superficial location of the tendon, should be recognized. If surgery is performed, the method of repairing the tendon with removable stainless steel wire after the method of Bunnell has merit.

Fractures at Base of Thumb Metacarpal

Fractures at the base of the thumb metacarpal are of two types: (1) Fracture not involving the joint, and (2) Fracture involving the joint with

an actual fracture dislocation (Bennett's fracture dislocation).

These fractures usually occur from a force on the radial side of the metacarpal, forcing it across the palm of the hand, resulting in outward angulation and prominence of the thumb metacarpal at its base. In fractures that do not involve the joint, the fracture is reduced by grasping the neck and the head region of the thumb metacarpal and pulling it backward and outward, while at the same time pressing firmly over the base of the metacarpal with the thumb of the other hand. Then, with the thumb metacarpal held in this position, a short arm plaster dressing is applied incorporating the thumb metacarpal and the proximal phalanx held in the slightly flexed position. Immobilization is carried out for a period of four weeks.

Bennett's fracture dislocation is more serious and the treatment is more complicated. The articular surface of the greater multangular bone is saddle shaped. The base of the fractured thumb metacarpal dislocates proximally with a smaller triangular fragment remaining in its normal position. This fracture dislocation is unstable and reduction is accomplished by traction in abduction on the extended thumb with pressure applied at the basal portion of the thumb metacarpal. Reduction is then maintained by pulp traction or skeletal traction to the distal phalanx of the thumb with a banjo type of splint incorporated in the short arm plaster dressing. Collodion gauze dressing encircling two narrow strips of skin extension tape can also be used. Traction should be continued for a period of four weeks and then discontinued and immobilization in the plaster dressing carried out for another

two weeks to allow for solidification of the fracture.

Dislocations of Carpal Metacarpal Joints

All four finger metacarpal bones can be dislocated posteriorly. Manipulative reduction should be carried out as soon as possible and immobilization carried out for three weeks in a dorsal plaster dressing. Occasionally, only one or two of the metacarpals are dislocated, and closed manipulative reduction should be carried out. Sometimes this is difficult but, fortunately, the bony thickening does not cause too great a disability as far as the function of the hand is concerned. Occasionally, a metacarpal may be markedly displaced either posteriorly or into the palm of the hand and, if closed manipulative reduction is not successful, open reduction should then be carried out. Reduction is maintained by a posterior plaster dressing alone or by the additional insurance of transfixion of the base of the metacarpal into the corresponding carpal bone with a Kirschner wire which is removed after three to four weeks.

Chip Fractures Involving Joints

Where a chip fracture of any size has resulted in marked rotation of the fracture fragment and closed manipulation is not successful, the fracture fragment should be replaced by open reduction. Occasionally, particularly in old cases, the bone fragment should be removed. Very small bone fragments usually do not cause any real trouble. The joints should be immobilized for seven to ten days before active exercises are started.

"O" TYPE MOTHERS LESS FERTILE

Blood group O mothers appear to have a lowered reproductivity as compared with mothers of other blood groups, reports Dr. Warren H. Pearse of the Department of Obstetrics and Gynecology, University of Michigan.

For some years, an apparent differential fertility has been suggested where mother and father belonged to different blood groups. An analysis of some 26,000 deliveries in Australia showed that group A women had a higher average number of pregnancies than did group O women. "The deficiency of group A (and apparently group B) children born to group O mothers

was not present in the first pregnancy, was present in the second and was greatest in third-born children. These findings may suggest some type of immunization mechanism," Dr. Pearse said.

"While there are conflicting reports, it seems definite that the ABO blood groups do result in a selective loss of incompatible children, and that there is a gradual reduction of fertility, or perhaps reproductivity, due to this selection."—PEARSE, W. H.: ABO blood groups in obstetrics, *American Journal of Obstetrics and Gynecology*, 74:538 (Sept.) 1957.

Renal Trauma

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INJURIES of the kidney are surprisingly rare considering the variety of violence to which modern man is exposed by the automobile, the tractor, the airplane, and by heavy industry. In 1941 Campbell found that renal trauma was responsible for but one in three thousand surgical admissions to Bellevue Hospital, which receives a large number of accident victims. Similarly, Nelson observed in 1948 that it caused but 0.03 per cent of 150,000 surgical admissions to the London Hospital. Guterbach estimated that the kidneys were injured in only 10 per cent of the victims of fatal violence.

The protected location of the kidneys undoubtedly accounts for their relative impregnability, since their consistency is such as to permit shattering by comparatively minor blows. They are protected behind by the spine and its muscles, as well as by the ribs, which also shield them to some extent laterally and in front, where the abdominal wall, perirenal fat, and intestines serve to cushion impacts. The loose attachments of the kidneys permit them a limited retreat from blunt forces. The kidneys of children are somewhat more vulnerable than those of adults because of their lower position and the scarcity of perirenal fat, and it is well established that large or distended organs are more easily injured than are normal ones.

The kidneys may be injured by a variety of forces, such as blows with blunt objects, falls (including those upon the feet and buttocks), crushing injuries (automobile wheels), and violent flexion or twisting. In addition, the literature contains a fair number of instances of spontaneous renal injuries, even in the absence of demonstrable antecedent disease. Penetrating wounds (missiles and knives) are quite uncommon in civil life, and are usually associated with injuries to other viscera which overshadow the renal lesions.

Changes in the kidney vary from laceration

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of a capsular vessel with a small perirenal hematoma to shattering or pulpification of the whole organ, with or without avulsion of its vascular pedicle. Late effects include necrosis of devascularized fragments with consequent secondary hemorrhage, infections in or about the kidney, urinary extravasation, and late fibrosis which may compress the kidney itself or the upper ureter.

At the Los Angeles General Hospital, which has an active emergency service, there were 220 renal injuries between 1934 and 1950. Eighty-four were classified as contusions, seventy-eight as lacerations, and twenty-two resulted from shootings or stabbings. In addition there were thirty-six which were incidental to extensive skeletal or visceral traumas.

It suffices to classify renal injuries rather simply as contusions (which include perirenal hematomata), and lacerations (which include rupture of the organ and avulsion of its vessels). Injuries to the renal pelvis and ureter will be discussed separately.

Contusion and Perirenal Hematoma

When contusions occur, there is pain in the flank with tender fullness, bulging, or a palpable mass in the region of the kidney. Spasm of the psoas muscle is common, and signs of anemia, hemorrhage, and shock vary with the amount and rate of bleeding. The urine is ordinarily clear but contains microscopic blood, although gross hematuria occurs with more serious damage. Roentgenography shows blurring or absence of the lateral margin of the psoas with, in larger hematomas, enlargement of the renal shadow. Curvature of the spine with its concavity toward the affected side may or may not appear, and elevation of the hemidiaphragm may be found. Excretory urography discloses a normally functioning and appearing kidney, although the collecting system may appear compressed; extravasation of contrast agent is uncommon. If contusion is extensive, function on the affected side may be absent, only to return later. A urogram should always be made so that the condition of

the opposite kidney will be known should operation become necessary.

At a variable time after injury there may be ecchymosis in Petit's triangle or in the groin. In other words, there is a history of injury with some evidence of internal bleeding, and clinical and radiologic evidence of a perirenal accumulation of fluid without the toxemia which accompanies perinephritic abscess.

Treatment begins with bed rest and close observations of the pulse, blood pressure, urine, local swelling, and hemoglobin. Conservative treatment with primary reliance upon transfusion is indicated unless bleeding gets out of hand, because bruises cannot be repaired surgically, and operation is likely to lead to removal of a potentially useful kidney. Because organisms may reach the traumatized tissue via the blood stream, a wide spectrum antibiotic should be given. A hematoma or perinephritic abscess may require later evacuation.

Subsidence of signs and symptoms should not lead to resumption of activity for two or, preferably, three weeks because of the danger of severe secondary bleeding.

If profuse hematuria persists despite repeated transfusions, surgical exploration is required. A conventional lumbar incision is indicated unless there is evidence of an intraperitoneal lesion. A large quantity of matched blood should be instantly available. Scholl has maintained that operation is easier and safer if a number of days has elapsed since injury, because much bleeding will have stopped spontaneously and the tissues will be less friable. Devitalized renal fragments may be removed, arterial bleeders ligated, and venous bleeding controlled by compression with ribbon catgut passed through "belt loops" made in the renal capsule. This should be tied just tight enough to stop the bleeding without strangling the renal substance. If the capsule has been stripped off by the bleeding, recourse may be had to packing with absorbable hemostatic agents or gauze. This may be inserted over a sheet of rubber dam to facilitate easy removal. If the kidney has to be removed and the capsule has been stripped off so as to conceal the renal vessels, it may be incised circularly around the hilus and the pedicle easily found. Scott's maneuver of compressing the aorta with a stick sponge may be invaluable in the presence of brisk arterial bleeding.

A patient treated successfully by conservative methods, either surgical or medical, should be kept under observation for a considerable time after recovery. Followup should include excretory urography to detect hydronephrosis from ureteral compression by late scarring, urinalysis to uncover silent infection, and repeated measurement of the blood pressure, because perirenal fibrosis may occasionally produce hypertension through compression of the parenchyma. These complications are not common enough to be used as arguments for nephrectomy at the time of injury, because a slightly crippled kidney is better than none, especially in a young person. Priestley has found that about 25 per cent of patients treated conservatively will be left with some disorder of the kidney.

Laceration of the Kidney

Obviously, laceration of the kidney differs from the foregoing only in degree: bleeding is more severe, blood pressure is harder to maintain, and local findings are more conspicuous. Since this represents a more severe trauma, associated extrarenal injuries are more common. Thus preliminary studies should include a film of the abdomen made in the upright position, if feasible, in order to detect free gas under the diaphragm. While the injured kidney may not be visualized by excretory urography, it should be employed if only to make sure that the other organ is competent to support life. If it is desired to delineate the affected kidney, retrograde pyelography properly done is innocuous, and will show extravasation.

The general principles of treatment have already been outlined. Because of the more extensive character of the injury there is more likely to be extravasation of urine or perinephritic abscess or both, and operation is more likely to be necessary. One may safely say, however, that the majority of renal injuries will heal with good conservative management. Of the 220 cases from the Los Angeles General Hospital already mentioned, only twenty came to operation, with one death. Many of the others who died were in the group with extensive extrarenal injuries, so that the renal injury did not play a significant part in the fatal outcome.

Injuries of the Renal Pelvis and Ureter

These structures are ordinarily protected from blunt trauma by their flexibility, mobility, and loose attachments; even penetrating lesions are

rare, coming more often from ureteral catheters and surgical instruments than from external violence. Symptoms depend upon the level and character of the injury, and consist usually of bleeding, followed by signs of urinary extravasation, and, if unrecognized, by infection and toxemia. Bleeding may be absent if the excretory channel is torn off.

If such a lesion is suspected but not shown in the excretory urogram, a retrograde pyeloureterogram will demonstrate it. If a laceration is found and a catheter can be passed to the renal pelvis, it should be secured in place and antibiotics administered. If clinical signs of extravasation appear, extraperitoneal drainage will be required.

A severed ureter requires repair. Ragged edges are trimmed off and a small Robinson catheter with extra eyes at the renal end is inserted through a perforation just below the injury and passed to the renal pelvis. A simple end-to-end anastomosis is made with fine chromic catgut (nonabsorbable sutures will become encrusted), which is also used to secure the catheter to the ureteral adventitia.

The ureters may be injured either surgically or cystoscopically. A catheter may be pushed through the ureteral wall in the presence of an ureteral stone or other obstruction. If the urine is sterile and the perforation is below the obstruction, no harm usually results. If virulent organisms are present, or if the hole is above the obstruction, relief of the latter and external drainage are essential. If local or general conditions prevent a definitive operation, nephrostomy may save the kidney, but should be supplemented by local drainage, correction of the obstruction being done later.

One or both ureters may be crushed, perforated, divided, or ligated during difficult pelvic or lower abdominal operations, usually as a result of clamping, sewing, or cutting in a pool of blood. If the injury is recognized at the time, ties and stitches should be removed from the area; if the ureter has been crushed, the damaged tissue should be removed and an end-to-end anastomosis made as previously described. Simple division is similarly treated but without removal of tissue. A small perforation (needle) can be covered with a flap of adjacent peritoneum (serous side down) without drainage. The localization of injury may be facilitated by the insertion of ureteral catheters through a cystoscope during operation.

Symptoms and findings of ureteral occlusion not recognized at the time depend upon the level and character of the damage, as well as upon whether one or both ducts have been injured. Bilateral occlusion causes anuria; urine leaking into the peritoneum produces peritoneal irritation and later demonstrable free fluid; if damage is bilateral, uremia will occur. An intraperitoneal leak can be demonstrated by excretory urography done before renal function has been suppressed. Any of these situations requires cystoscopy and ureteral catheterization to disclose the level of obstruction. Occasionally, this will be due to simple kinking of the ureter by an adjacent ligature. If a catheter can be passed to the renal pelvis, a Foley catheter should be inserted into the bladder and the former tied to it. They should be left *in situ* for some time. Usually, however, bilateral obstruction will prove to be complete and will require surgical correction. If the general state is good, the incision should be reopened and the offending ligatures removed or the necessary repairs made as already outlined. If it is poor, unilateral nephrostomy is made and the ureters repaired later. Rarely after nephrostomy, an obstructing tie will be absorbed so that no further treatment will be necessary.

Unilateral injury may be silent or cause chills, fever, or renal pain. If the opposite kidney is normal, unilateral ligation will not be reflected in the urinary output. Sometimes it will first be suspected after an extravasation has ruptured externally, resulting in an urinary fistula. This is readily identified; the ureterovaginal fistula is readily distinguished from the vesicovaginal variety by the fact that colored fluid injected into the bladder will not enter the vagina in the former.

The occurrence of an urinary fistula necessitates ureteral catheterization. Obstruction is found on the side and at the level of the fistula. In the unlikely event that the catheter on the affected side will pass to the kidney, it should be left inlying for some time in the hope that the fistula will close.

If obstruction is complete, surgical correction is needed. If the patient is elderly with a normal opposite kidney, nephrectomy is the simplest solution. In younger patients and in older ones with abnormal opposite kidneys, surgical repair of the

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Tracheotomy in the Acutely Injured Patient

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RECENTLY trauma to the head, face, neck and chest has provided many indications for tracheotomy. In times past, most tracheotomies were done to relieve obstruction of the airway caused by inflammatory conditions or neoplasms. Acute injuries of rather severe degree are becoming more common in our modern civilization with its rapid transportation.¹⁻³

Tracheotomy is a useful procedure in head injuries with cerebral concussion, even though the face and neck are not injured. In the unconscious patient the jaw relaxes, the tongue falls back into the throat, and evacuation of secretion from the pharynx by voluntary means under control of the patient ceases. Pooling of secretion in the pharynx may occur and aspiration of this secretion may follow. Aspiration of vomitus is not uncommon. The use of feeding tubes produces irritation of the pharynx and causes more secretion to be formed in the pharynx. Cough reflex is at a minimum of efficiency. The use of tracheotomy to permit frequent and adequate cleansing of the lower respiratory tree has grown steadily in recent years. Similar indications exist in barbiturate and other poisonings.

Jaw fractures, injuries to the front of the neck with edema of the pharynx, and fracture and edema of the larynx make it necessary to provide an airway by opening the trachea below the point of injury; inability of the patient to clear his own airway may occur in these conditions, as well as in cerebral concussion or poisoning.

Tracheotomy in burns may be necessary because of aspiration of hot gases which cause edema of the larynx. In World War II, it was found that aviators who were apparently in good condition when rescued from burning aircraft sometimes died unless "prophylactic" tracheotomy was per-

formed; secondary swelling of the laryngeal interior occurred, and the patient died of asphyxia even though all other potential causes for death were under control.

During the past few years, the use of tracheotomy in the treatment of chest injuries has become more and more widespread.⁴⁻⁶ The purpose of tracheotomy in chest injury is twofold. Cleansing the lower respiratory tree by suction through the tracheotomy probably is the most important reason for doing tracheotomy in chest injuries. A second indication occurs in the so-called "flail chest." Here a large segment of the chest wall "floats" and there is paradoxical motion on respiration. When the patient breathes in, the flail segment of the chest goes in instead of out, because it is no longer anchored to the rest of the chest wall.

It has been shown by several authors that patients with flail chests do better with tracheotomies, because the total volume of air moved during the respiratory act is reduced. Resistance of air coming in through the tracheotomy is less than through the nose and pharynx. Experimental work measuring pressures in the pleural spaces before and after tracheotomy in humans and in dogs has shown a definite advantage in the case of tracheotomy.

Positive pressure can be applied during the inspiratory phase of respiration to provide stabilization, or at least partial stabilization, of the flail segment of the chest. This reduces pain and also increases respiratory efficiency.

Wounds of the larynx, fractures of the larynx, fractures of the trachea constitute indications for tracheotomy. Perhaps the first case of tracheotomy in trauma reported was that of Habicot who wrote in 1620 A.D. He recounted the case of a boy wounded and left for dead. He opened the boy's trachea and removed a laryngeal blood clot. Habicot had two other successful cases, one was an officer with a cut throat, and the other was a young woman with a gunshot wound of her

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throat. In 1714, Detharding recommended that the operation be done on persons apparently drowned. This recommendation was later reiterated by Heister (1739) and de Pouteau (1783) in order that all water might be got out of the lungs through a tube.⁷

A most interesting case report, for an indication which will not be met in normal life, is as follows: A London surgeon named Chovell persuaded a condemned man named Gordon to allow him, for a substantial fee, to perform a tracheotomy upon Gordon the night before his execution by hanging was scheduled. The surgeon reasoned that the rope would go around the condemned man's neck above the point where the trachea would be opened. The condemned man was to hang for a certain number of minutes and then be cut down. If he could survive the hanging, he had satisfied the law's requirement that he be punished. The surgeon had tried the experiment on several dogs always with success. But his human subject, although still alive when cut down by his friends after the hanging, succumbed very soon.

Tracheotomy can be done under emergency conditions or can be done in orderly fashion. It is possible to convert emergency conditions into orderly conditions by introducing an airway through the larynx when this is possible.

Laryngotomy or intercricothyrotomy consists of making a horizontal incision through the cricothyroid membrane and holding the opening patent by some temporary type of retractor until a real tracheotomy can be done. Intracricothyrotomy should always be a temporary procedure. If it is not, damage to the voice will occur.

Emergency tracheotomy is done, according to the technique of Chevalier Jackson as follows: The surgeon stands on the patient's right and with his left hand sweeps the soft tissues away from the midline by pushing his thumb and middle finger from the midline laterally. He makes a vertical incision in the midline following the knife with his index finger down the front of the larynx and trachea. He feels the cricoid cartilage, then the tracheal rings and guides the knife blade through the tracheal rings and holds his finger there until something can be put into the trachea to hold it open. Naturally, there is profuse bleeding and the procedure must be revised as soon as orderly conditions occur.

Orderly, or tranquil, tracheotomy is done when an airway can be provided. The introduction of a bronchoscope, an anesthetic endotracheal tube, or a Mosher lifesaving tube, through the larynx provides the patient with an airway and permits orderly tracheotomy to be done. It may be done under local or general anesthesia depending upon the conditions. Infiltration with one per cent procaine is satisfactory. One can make a midline incision or a "collar" incision. In small children, there is more danger of skeletonizing the trachea too much with a collar incision. In adults, the contraindications to a collar incision are much less valid than they are in children.⁸

The skin and superficial fascia are incised and veins are secured and ligated. The deep fascia is incised until the thyroid isthmus is encountered. The thyroid isthmus may be cut in the midline or retracted. We generally cut it in the midline. The cricoid and trachea are identified and the tracheotomy incision is made through the second or third tracheal rings and a "button" of tracheal wall is removed. This does no harm to the trachea on a permanent basis and makes changing of the tube much less dangerous than when a "slit" incision is made in the tracheal wall. A tracheotomy tube of proper size is inserted and the wound is not closed; this helps to prevent emphysema of the soft tissues of the neck and head.

Errors and accidents accompanying tracheotomy.—Too short an incision prolongs the operation and makes it more difficult; after incision of the skin and superficial fascia, the next layer may not be separated in the midline and the operator may become disoriented; the dome of the pleura may be punctured as it bulges up into the wound and pneumothorax may be induced. The knife used to incise the trachea may be carried through the posterior wall of the trachea into the esophagus. The cannula may fail to enter the tracheal lumen and may make a false passage outside of the trachea. The operator may fail to identify the cricoid cartilage and open the larynx instead of the trachea; this results in difficult decannulation and damages the voice very markedly. Entrance of blood into the trachea can be prevented by proper hemostasis unless there is very urgent need for opening the trachea. It should be sucked out carefully when conditions are orderly and will be coughed out by the patient unless

he is unconscious when emergency tracheotomy is carried out.

Postoperative complications include emphysema of the subcutaneous and fascial layers of the neck. This is usually not serious. Emphysema of the mediastinum occurs in many cases of tracheotomy and is not particularly important unless pneumothorax occurs with it. Pneumothorax, which sometimes occurs, may be fatal if it is bilateral. If there is a "tension pneumothorax," the condition may have to be relieved by endothoracic suction. Blood in the mediastinum was found at autopsy in one of our cases, although it did not appear to be the cause of death. Laryngeal or tracheal stenosis should not follow a properly done tracheotomy. Wound infections are rare, particularly since antibiotic therapy has been available. Tracheitis usually follows tracheotomy but is transitory.

Decannulation is carried out after the tube has been plugged by a rubber stopper for twenty-four to forty-eight hours. If the tracheotomy has been

properly performed, decannulation should not be difficult.

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RENAL TRAUMA

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fistula is indicated. If the fistula is close to the bladder, ureteral reimplantation is preferred. If the opening is too high for this, and especially if the ureter distal to it has been destroyed, some form of ureteral substitution is needed. Defects extending as high as the brim of the pelvis can be replaced with tubular flaps fashioned from the bladder (Boari). A two-stage procedure is required to replace both pelvic ureters by this method. Anastomosis to the ureter must be meticulously accurate, and a catheter must traverse the new and old ureters so that the eyes of the catheter lie in the renal pelvis, lest urine pass down along-side it and burst suture lines with recurrence of the fistulae.

When the defect is too long for this method, one may isolate a loop of distal ileum, make an enteroanastomosis around it, close both ends of

the loop, and implant both ureters into it (Longuet, Pyrah). The middle of the loop is widely joined to the bladder. For unilateral defects a shorter loop is closed at one end and joined to the bladder at the other, the ureteral stump being implanted near the upper end. If necessary, the whole ureter can be replaced in this manner (Annis).

Very occasionally, as Millin has pointed out, anuria following pelvic operations may result from compression of the ureters by a pelvic hematoma. In such cases, ureteral catheters pass without difficulty and free diuresis ensues as long as they are present. Such an hematoma may require evacuation.

Periodic ureteral dilatations should be carried out at increasingly longer intervals after any ureteral injury in order to detect and dilate strictures.

Successful Expulsion of Tapeworms

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QUESTIONS frequently are directed to parasitology laboratories relative to the therapeutic expulsion of tapeworms, and reports of repeated failures to accomplish this have been received. The primary objective in the care of a patient harboring a tapeworm is the recovery and identification of the head of the worm. Failure to accomplish this means inability to determine the results of the treatment. This is true whether the parasite be *Taenia solium* (pork), *T. saginata* (beef), *Diphyllobothrium latum* (fish), or one of the smaller forms, such as *Hymenolepis nana* or *H. diminuta* (cereals). Immediate riddance of these worms is a major concern for patients who know they are harboring them.

In the case of *T. solium*, which is rare in the United States, there is further concern beyond that of the esthetic considerations because of the danger in the continued presence of this parasite in the intestine. The eggs of *T. solium* are able to hatch in the intestine of the human host; the larval stage (onchosphere) then pierces the intestinal wall, is carried by the blood to various sites, such as the brain, and produces cysticercosis not unlike that seen in the hog, which serves as the intermediate host.

Cysticercosis is difficult to treat and may prove fatal. Thus, the person known to be harboring the adult pork tapeworm should be freed of the parasite as quickly as possible. The head of the worm should be recovered and identified, after which the patient need have no further concern beyond avoidance of the repetition of infection. However, if the head is not recovered, a needless period of doubt and delay ensues with the serious potential consequences already mentioned. The term "needless" is used advisedly, since there is, and has been for some time, available a method of treatment that, when conducted properly, will assure success.

From the Section of Clinical Pathology, Mayo Clinic.

This is the thirty-eighth in a series of editorial reports sponsored by the Minnesota Society of Clinical Pathologists and designed to foster closer relationships between clinicians and pathologists.

This method was described in 1927 by Magath and Brown.¹ It involves three essential steps, namely (1) preparation of the patient, (2) administration of the anthelmintic and (3) the search for and recovery of the head. The first step requires the patient to forego lunch and supper on the day prior to treatment, although coffee, tea or water may be taken freely. The evening prior to treatment, the patient takes 15 to 30 gm. of magnesium sulfate, and the same dose is taken again early the next morning. No breakfast is given. After a bowel movement, the patient is given 30 ml. of the following emulsion: oleoresin of aspidium, 6 gm.; powdered acacia, 8 gm.; distilled water to make 60 ml. One hour after administration of the first 30 ml. of this emulsion, the second 30 ml. is given. Two hours after the second dose of emulsion, 30 gm. of magnesium sulfate is given, followed two hours later by a large soapsuds enema. For children, and for adults who cannot tolerate the treatment by mouth, it is preferable to administer the materials through a gastric tube. The amounts of magnesium sulfate and oleoresin of aspidium should be reduced by half for children.

The method of collection of stools requires emphasis. This part of the procedure is critical, and it demands absolute attention to details and strict supervision by the physician or those assisting in the procedure. Stools passed prior to administration of the aspidium should be collected in one container and kept separate from those collected in a second container, which is designated "following aspidium." It is imperative to have available large receptacles that the patient may use directly; stools should not be collected in vessels to be transferred to other containers. Strict supervision of the patient is required so that no toilet paper or other material be allowed in the containers. The patient should not use a flush toilet. The search for and recovery of the head of the worm should follow immediately after passage of stools following the enema.

When the procedure has been carried out as just outlined, the receptacle used after treatment will contain several quarts of water, shreds of mucus and the tapeworm. The water is decanted carefully through a large (at least 12 cm. in diameter) 20-mesh sieve. Warm water is then run gently through the sieve to remove debris, leaving only the tapeworm. The contents of the sieve then are emptied into a black enamel pan measuring about 25 by 30 cm. The inverted sieve is rinsed out thoroughly with warm water into the pan so that nothing remains on the meshes. The search for and positive identification of the head of the worm are done by examining the entire specimen and any portions broken from it.

One often recovers a complete and intact specimen from terminal segments to head. However, owing to mechanical injury in passage and the active peristalsis resulting from the treatment, one sometimes recovers specimens that are broken in several places. The head may be present in the washings but may be broken off so near the first segment that extreme care in the search is required. It is also for this reason that no food particles or toilet paper be in the recovered material. I have been confronted on occasions with the presence of food particles and by diligent searching and good fortune have found the head inside the undigested shell of a kernel of corn or a pea; once it was found adhering to a small clump of disintegrated toilet paper that was among several pieces in the container.

If the head is not recovered, the success of the treatment remains in doubt, as already mentioned. Then a period of approximately twelve weeks must

follow in order to allow segments to develop and appear in the stools, which will occur if the head has not been expelled.

During the thirty years following publication of this standardized treatment for tapeworms, many patients infested with these parasites have come to this laboratory. In most instances, they have told of previous repeatedly unsuccessful courses of treatment involving a variety of drugs and techniques. The method just outlined has resulted in no failures to date in all patients on whom the procedure has been carried out with precision and with attention to details.

Without trying to evaluate other methods currently advocated in the literature, I should like to mention three trials in which quinacrine hydrochloride (atabrine) was substituted for emulsion of aspidium. Two were attempts to eradicate *T. saginata* and one was an attempt to expel *D. latum*. Results of all three trials were unsatisfactory. Portions of the worms were recovered, but the head was absent from the collected material. In each of these three instances, when the patients returned for a second course of treatment, oleoresin of aspidium was used and the entire worm and its head were expelled. This time-proved method of Magath and Brown is recommended to those who have difficulties in effecting expulsion of entire tapeworms and recovery of the all-important head.

Reference

1. Magath, T. B. and Brown, P. W.: A standardized method of treating tapeworm infestations in man to recover the head. *J.A.M.A.*, 88:1548-1549 (May 14) 1927.

IMPORTANCE OF X-RAY IN APPENDIX CONDITION

X-ray examination can be the basis for life-saving surgical removal of appendiceal coproliths, even when the physical examination and symptoms fail to present a clear cause for abdominal pain.

This is the report of two radiologists from Bismarck, N. D., Drs. R. M. Berg and H. Milton Berg, who reported their experience with the coproliths in the June, 1957, issue of *Radiology*.

Sometimes a patient's symptoms are not characteristic of the presence of the coproliths, which cause the appendicitis, the Bismarck physicians pointed out.

"A review of thirty-five patients with the condition reveals that 50 per cent would not have had sufficient evidence, without x-ray findings, for surgical explora-

tion, despite the history, physical and laboratory examinations. In four patients, the physical examination was entirely normal, although acute symptoms were present," they added.

Other conclusions in their report:

—The correct diagnosis can frequently be achieved only by x-ray examination of the abdomen. Other findings were insufficient to justify a diagnosis of appendicitis in half of the patients.

—There is a 90 per cent chance that a patient with the coproliths has an acute appendicitis; there is a 48 per cent chance that the appendix is gangrenous or perforated.

Spontaneous Pneumothorax

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THE PROBLEM of spontaneous pneumothorax is one which deserves serious attention by the physician because of the urgency of a tension pneumothorax with mediastinal displacement or a bilateral pneumothorax. Death may result from either of these latter circumstances.

Because of this the physician should be in complete control of the situation at all times, and this control can best be obtained by surgical excision of ruptured blebs or bullae, usually located on the apex of the lung. When a bilateral pneumothorax is encountered, one can do a simultaneous, bilateral thoracotomy through a transverse, transternal incision in the 4th intercostal spaces anteriorly with astonishingly low morbidity.

The diagnosis of spontaneous pneumothorax is difficult without a roentgenogram of the chest. Patients sometimes ascribe the onset of their difficulty to lifting, stretching, reaching, or childbirth. Major symptoms are shortness of breath and pain. The latter may be a constant, dull ache or may be aggravated by deep respiration and coughing. When a tension or bilateral pneumothorax is present, the patient may be restless, very dyspneic, or even cyanotic and comatose. Auscultation with the stethoscope is seldom helpful. Palpation of the neck with deviation of the trachea to the opposite side, however, may lead one to suspect the proper diagnosis.

Alternatives of treatment other than open thoracotomy are attended with prolonged hospitalization and disability. Maintenance of constant negative pressure via a catheter inserted into the pleural space requires several days of hospitalization followed by inactivity and observation at home for fear of recurrence. More than one catheter may have to be inserted. This form of treatment has been somewhat simplified by the use of the Fuller-Clagett S-needle, but the duration of treatment remains the same.

Simple bed rest may require even a longer period of time. The insertion of irritants such as talcum powder or hypertonic solutions have not been very satisfactory.

Thoracotomy remains, then, the treatment of

choice. One can examine the entire lung, and if no bullae are readily apparent, the common finding is a small area of fibrosis or "scar" in the apex. Ehrenhaft¹ has shown that this scar is found in tuberculin-negative as well as tuberculin-positive patients and is, therefore, nontuberculous. In the midst of this small scar there is usually a tiny bleb which is the source of the pneumothorax. This may be seen more readily when the anesthesiologist vigorously applies transient positive pressure (to 25 cm. of water). This area is then excised by wedge resection, a portion of the pleura either roughened or removed, and the thorax closed. Most patients are out of the hospital in a week and may rest assured that the source of their pneumothorax has been removed.

Reference

1. Ehrenhaft, J. L., Tabor, Rodman E., and Lawrence, Montague S.: Spontaneous pneumothorax. *Am. Rev. Tuberc.*, 72:801, 1955.

Editorial Comment

Dr. Connolly is to be congratulated for taking a firm stand in expressing his opinions concerning the treatment of spontaneous pneumothorax. There are many thoracologists, however, who would consider his approach to the problem a radical one, and there are a few who would consider it a bit too conservative.

Perhaps one should fit the treatment to the individual patient or to the magnitude of the problem each patient presents. Certainly, many minimal pneumothoraces are undetected, perhaps are called "pleurisy," and heal without treatment. Some of those which are minimal require only brief observation after detection. The majority may be treated very satisfactorily by constant suction for twenty-four hours via a malleable S-needle, then observation for twenty-four to forty-eight hours. Total hospitalization may be two to three days. When surgery for uncontrollable pneumothorax is necessary, Dr. Connolly's operation may be applicable. Excision of the parietal pleura, however, has been done by many surgeons with satisfactory results. Recently, bilateral simultaneous thoracotomy has been proposed for unilateral spontaneous pneumothorax.

These comments are made so the reader will realize that the treatment of this condition is not stereotyped and that there is not unanimity of opinion concerning the proper treatment for every patient with a spontaneous pneumothorax.

HOWARD A. ANDERSEN, M.D.

Clinical-Pathological Conference

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DONALD F. GLEASON, Editor

CASE PRESENTATION—MINNEAPOLIS VA HOSPITAL

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First Admission (1939).—A forty-four-year-old white man, a chronic alcoholic, received serum therapy for Type II pneumococcal pneumonia of the right middle lobe. He had a reaction characterized by arthralgia and an erythematous eruption. The blood pressure was 145/80, the pulse rate 96 and the urinalysis was normal. There was no history of scarlet fever or renal disease. He had had gonorrhea in 1920 and had been treated for syphilis. The serum Wassermann and Kahn tests were positive.

Second Admission (1945).—He was hospitalized for a pneumonia of the right lung, in association with an hallucinosis and following an alcoholic debauch. The blood pressure was 140/85 and the pulse rate 130. The urinalysis was normal. The serum Wassermann was 3-plus and the spinal fluid Wassermann was negative.

Third Admission (October, 1950).—He was received in transfer from another hospital, where he had been given penicillin and digitalis. He was now complaining of severe exertional dyspnea and paroxysmal orthopnea, with intermittent ankle edema and cough for six months. The temperature was 98.0 degrees F., the blood pressure 150/108 and the pulse was 62 and irregular. The fundi showed only some arteriolar attenuation. The vital capacity was 2.4 litres, slowly expelled. Three urinalyses showed a maximum concentration of 1.015 and a trace of sugar in one specimen. A chest film revealed a resolving pneumonia of the right middle lobe, plus some ectasia of the ascending aorta. The ECG showed broad, notched P waves, frequent premature ventricular beats and depressed ST segments over the myocardium of the left ventricle. A course of penicillin was completed for latent lues.

Fourth Admission (February, 1951).—He was hospitalized after being recalled for follow-up. The blood pressure was 115/110 with a pulse of 62 and later was 140/90 with a pulse of 94. The cardiac silhouette had enlarged and there was evidence of early pulmonary

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congestion. He was instructed in salt restriction and, after some symptomatic improvement, was released.

Fifth Admission (August, 1951).—He returned with a recurrence of dyspnea and dependent edema. On examination, the neck veins were distended. The right pupil was larger than the left but both reacted normally to light and accommodation. The blood pressure was 180/100. The pulse rate was 130 and irregular. There was a soft apical systolic murmur in association with a gallop rhythm. The ECG was unchanged. The brom-sulfalein retention was 12.5 per cent after forty-five minutes and the zinc sulphate turbidity was 18.5 units. He responded well to treatment and was discharged on digitoxin and salt restriction.

Sixth Admission (Dec, 1951).—He had complained of a sudden "heart attack" in which his arms had become stiff and numb and he had vomited. There had been no pain or dyspnea and the symptoms had been relieved by brandy. The blood pressure was 160/98 in the right arm and 146/90 in the left arm. The ECG showed frequent runs of premature ventricular beats from different foci and the QRS complex was widened. Five urinalyses revealed a maximum concentration of 1.016 and traces of sugar and albumin were noted. The hemoglobin was 12.2 grams per cent.

Seventh Admission (August, 1952).—He returned with recurrent dyspnea and edema. He was disoriented and was perspiring profusely. Moist râles were heard over the lung bases, a presacral edema was present, the neck veins were distended in a sitting position and Cheyne-Stokes respirations were noted. There was irregular attenuation of the retinal arterioles and two flame-shaped hemorrhages were seen near the right disc. The heart was enlarged and exhibited a gallop rhythm with a Grade 2 blowing systolic murmur at the apex. The blood pressure was 158/128 and the pulse rate was 130. A PA film of the chest revealed further increase in the heart size and in pulmonary congestion. Two urinalyses revealed traces of albumin and sugar, as on a previous admission. The fasting blood sugar was 71 mgm. per cent. The ECG now exhibited a complete left bundle branch block. The serum Wassermann remained positive. He again responded well to a regime of penicillin and salt restriction. Digitoxin was discontinued.

Eighth Admission (November, 1952).—The dyspnea and orthopnea had recurred but without edema. He had raised some blood-streaked sputum for two days. Precordial pain on exertion had become a problem since his last admission. Fine, moist râles were heard over the right lung base posteriorly. The heart was markedly enlarged. The second heart sound was well preserved and of equal intensity in the aortic and pulmonic areas. The blood pressure was 160/110. The fundi revealed focal and generalized arteriolar narrowing. The circulation time from arm to tongue was 20 seconds. He was digitalized and received aerosolized penicillin. He

again improved promptly and was discharged after eight days.

Final Admission (August, 1953).—The patient stated that he had continued to take his digitoxin and had felt fairly well until the two weeks prior to admission. At that time, after a heavy alcoholic intake, he had again suffered from increasing dyspnea, orthopnea and ankle edema. On examination he was apprehensive, very cyanotic and orthopneic. The neck veins were distended. The rectal temperature was 100 degrees F. The blood pressure was 170/110. The pulse rate was 145, with total irregularity. Moist râles were heard over both lung bases. The heart was grossly enlarged. The liver edge descended four fingerbreadths below the costal margin. There was minimal pitting edema of the ankles. The venous pressure was 28 centimeters of isotonic saline. The circulation time had increased to thirty-seven seconds. The ECG now showed rapid atrial fibrillation with multifocal, premature ventricular beats and an intraventricular conduction defect. Ten minutes following the administration of 0.4 mgm. of digitoxin intravenously, the rhythm was found to be regular and the rate 160. Within five minutes, however, atrial fibrillation returned and continued thereafter. He expired three hours after admission.

Discussion

DR. EDMUND B. FLINK: It is always a pleasure to participate in one of these conferences. There are many interesting features in this protocol. This man had at least three different episodes of pneumonia—one in 1939, one in 1945 and one in 1950. He might have had an agammaglobulinemia but there is a better and more common explanation for his multiple episodes of pneumonia, namely chronic alcoholism. He had a reaction to serum therapy which was characterized by arthralgia and an erythematous eruption. In other words he had serum sickness. The rest of his course, however, permits one to dismiss a hypersensitivity state as being of importance. He had an incidental history of gonorrhea and lues, incidental because it is unlikely that lues had anything to do with his subsequent course.

On the third admission some of his symptoms suggest the ultimate cause of this man's death. He complained of severe exertional dyspnea, paroxysmal orthopnea and some ankle edema. I am impressed by the word "paroxysmal." His blood pressure was 150/108 and his pulse was irregular. Later the electrocardiogram showed multiple, premature contractions of ventricular origin, as the cause of his arrhythmia. He probably did not have atrial fibrillation at that time. Notice that he had a vital capacity of 2.4 litres, slowly expelled. He was by this time 54 or 55 years old and undoubtedly had some emphysema. I do not think that emphysema was an important factor, however. He also had a resolving pneumonia but this, I think, was a secondary phenomenon. Notice that traces of glycosuria were found on several admissions. I believe that the glycosuria is significant. On the fourth admission his blood pressure was stated to be 115/110. Is that correct?

DR. NESBITT: Yes.

DR. FLINK: Someone must have written it incorrectly. You can have your choice. You can have 195, 185, 175 and all the way down to the 115 as stated for

the systolic blood pressure. It was probably 175 and someone wrote it to look like 115. On that admission it was first noted that his heart was enlarged. He had a recurrence of congestive heart failure as indicated by dyspnea and edema and it was noted that he had neck vein distention. He had some bromsulfalein retention and a high zinc sulphate turbidity, suggesting that he had cirrhosis of the liver. The diagnosis of cirrhosis in the presence of congestive heart failure on the basis of two laboratory tests is difficult.

The sixth admission began with the complaint of a sudden "heart attack," in which his arms became stiff and numb and in which he vomited. These symptoms should be considered with the severe exertional dyspnea and paroxysmal orthopnea which the man had in August. Notice that his ECG is becoming more abnormal as time goes on and that eventually he develops a left bundle branch block. This is not an uncommon sequence in a patient who has hypertension. Serial tracings reveal that the QRS complex becomes progressively more prolonged. This does not necessarily mean, in my opinion anyhow, that there was an occlusion of one of the coronary arteries.

On the seventh admission he had recurrent dyspnea and edema and profuse sweating appears to be another important clue. Notice now that his retinal findings had progressed. Irregular attenuation of the retinal arterioles and two flame-shaped hemorrhages were noted, which simply means that he had continuing hypertension. His blood pressure had never been very startling and yet he developed these retinal findings in association with an increase in heart size and congestive heart failure. Traces of sugar and albumin were again found in the urine. The fasting blood sugar was normal and I would like to ask if there were any other determinations of the blood sugar or of the glucose tolerance at any time.

DR. NESBITT: That is the only fasting blood sugar reported and there is no record of a glucose tolerance test.

DR. FLINK: The assumption can be made that he had intermittent hyperglycemia and that the blood sugar was normal at other times.

On the eighth admission the findings are not very different. However he had complained of some precordial pain on exertion for a few months before his return here. This is not surprising in a man who had persistent hypertension. Certainly with the combination of hypertension and his age and with episodes of congestive heart failure, it is not surprising that he should have had precordial pain, indicating that he undoubtedly had some sclerosis of his coronary arteries. His heart was markedly enlarged at that time. Notice that his blood pressure again was not very high. Incidentally, was a serial record of his blood pressure kept?

DR. NESBITT: No.

DR. FLINK: The circulation time was twenty seconds. One of the causes of congestive heart failure, of course, is hyperthyroidism superimposed on another lesion of the heart or on hypotension but under such circumstances the cardiac output would be increased, rather than

decreased. This is just a straw in the wind. Actually there is no other evidence for this and I probably shouldn't build a straw man just to knock him down, without any more evidence.

On the final admission he again had become rather ill in a short period of time. He had been drinking quite heavily and it is a little difficult to sort out cause and effect. He was apprehensive, very cyanotic and orthopneic. He had the signs of congestive heart failure again. His blood pressure was 170/110 and his pulse rate was 145 and totally irregular. This time he had atrial fibrillation with many premature ventricular beats. He died suddenly three hours after he was admitted to the hospital. I would like to see the x-ray films at this time.

DR. J. V. TESTOR (Resident in Roentgenology): I have selected some representative films from each of his hospital admissions. This is one from his first admission in 1939 and shows the middle lobe pneumonia that was described in the protocol. His next admission was in 1945 and here again we see extensive pneumonia, this time predominately in the right upper lobe. The remainder of the lung films appear clear and his heart appears to be of normal size in 1945. His third admission occurred in October, 1950, and we see the resolving right middle lobe pneumonia that was described. I believe there was no mention of cardiac enlargement in the protocol at that time, but I do have films here from the cardiac fluoroscopy which was done then and I think there is evidence that the heart had enlarged, especially in comparison with the earlier films. In the LAO projection it appears that the enlargement is primarily left ventricular. This man had lues and we looked for evidence of luetic aortitis, but were not overly impressed with the size of the aorta. For this man's age I would say it was within normal limits and I can see no evidence of calcification or of dilatation of the ascending portion of the aortic arch. There is no evidence of valvular calcification. On the next admission, in 1951, we see that the heart had become greatly enlarged in comparison with the previous studies. We have evidence of pleural effusion on the right. We also have evidence of pulmonary congestion. You can see the effusion running up into the interlobar fissure on the right. In August of the same year no appreciable change is seen. On subsequent admissions we see some pleural effusion on the left as well as on the right and the vascular markings are accentuated. In December, 1951, a comparison of the oblique films suggests an actual reduction in cardiac size. I think further cardiac enlargement was initially described on this admission. These films may have been taken after treatment because the over-all heart size does look smaller than it did on the earlier examination in August of that year. The final film taken in August, 1953, shows a massive cardiac enlargement with pulmonary congestion.

DR. FLINK: Is a film of the abdomen available?

DR. TESTOR: We have a single flat plate of the abdomen. One can see the liver edge and the liver does not

appear enlarged. I am not able to identify the spleen. The renal shadows are not clearly visualized either. No conclusive evidence of any abnormality within the abdomen can be detected from this film.

DR. FLINK: Thank you. I would like to ask whether serial weights were recorded on this patient.

DR. GLEASON: I looked for them. There aren't any weights recorded during the first two admissions. He weighed 146 pounds in 1950 and on subsequent admissions his weight fluctuated between 158 and 168 pounds.

DR. FLINK: After seeing the films, it appears that the emphysema must have been minimal. Perhaps the vital capacity was compromised by the pneumonia and congestive heart failure. I think he had some cirrhosis and he had lues which was treated and was insignificant. There was no evidence, as we have seen, of an aortic involvement by lues. The primary disease that we are concerned with is the hypertension with recurrent congestive heart failure. I have pointed out several places in the protocol where sudden attacks of heart failure had occurred. Paroxysmal dyspnea can occur in ordinary hypertension. In fact this is the usual manifestation of left ventricular failure, regardless of cause. There was no evidence of renal disease. He did have some albuminuria but this was minimal and there was a striking lack of any statements in the protocol relating to the kidney. I intended to ask about the blood urea nitrogen determinations. I assume they were normal.

DR. NESBITT: They were.

DR. FLINK: Of course primary hypertension is a possibility. This is the diagnosis usually made in a situation like this. I expect that a diagnosis of hypertension with hypertensive and arteriosclerotic heart disease was made clinically. However, the history of profuse perspiration and the sudden attacks of dyspnea are important. The word "paroxysmal" was used to describe the dyspnea. This use may have been inadvertent, but it is at least suggestive of importance to me. Of course it may have been used deliberately (*laughter*).

These considerations, plus the frequent presence of sugar in the urine in the face of a normal blood sugar, all make one think of a pheochromocytoma. There is one other extra-clinical reason for suspecting that diagnosis in this instance. I didn't think that I would be asked to discuss this case if it were just hypertensive heart disease. Therefore I am going to extend a long neck (which may not remain long for any period of time) and make a diagnosis of pheochromocytoma. I can defend that diagnosis on the basis of what we read in the protocol.

There are many reviews on pheochromocytomata, as you know. The paper on this subject given by Dr. Vernon Vix at our Medical Grand Rounds is a good source of information. There are two additional reports that I want to call to your attention. Minno et al. found fifteen cases of pheochromocytomata at autopsy which had been unsuspected clinically. One was suspected before death but the patient died so soon after arrival at the hospital that nothing could be done. The

hypertension was persistent in ten of these cases. Twelve of the patients died of the complications of pheochromocytomata. Pulmonary edema occurred in five and, in reviewing the literature on this subject, one notes that the development of pulmonary edema was generally found to indicate a poor prognosis. Pulmonary edema in ordinary hypertension, of course, is a grave sign also. There is another review of a selected group of cases by Green. He reviewed fifty cases and found definite sustained hypertension in thirty-seven of these. Only fourteen patients had paroxysmal hypertension. The sum of the two groups totalled fifty-one instead of fifty, however. Sustained hypertension was related to the duration of the presence of symptoms for the most part. There was definite cardiac enlargement in seventeen of the thirty-seven cases. There were ten who had left axis deviation on the ECG. Twenty had albuminuria. Azotemia was present in two cases. Some abnormality in renal status was present in twenty-four of the thirty-seven cases of sustained hypertension. At autopsy there was no significant renal pathology, however, in nine of the sixteen cases in this group that came to post-mortem examination. The major causes of death in the patients not operated were acute left ventricular failure, cerebral vascular accident and chronic congestive heart failure. I think on the basis of reviews of this subject, that my diagnosis can be at least defended. I hasten to add that I have entertained this diagnosis a number of times on previous patients but have been proven correct only in those instances where the diagnosis had already been suspected and where appropriate tests were confirmatory.

DR. NESBITT: Is there any further discussion? Remember that this may be the day we start to discuss garden variety cases in these conferences. Dr. Zieve, do you have anything to say?

DR. L. F. ZIEVE: I must say that I didn't think of a pheochromocytoma in this case, but now that Dr. Flink suggests it, I was wondering if Dr. Nesbitt had any further information tucked away to explain that pupillary inequality that occurred in 1951. Did he have any evidence of a vascular accident?

DR. NESBITT: No, there is no further description in the chart.

DR. R. E. SMITH: Dr. Flink asked me to collect the diagnoses made by the medical students and thereby relieve him of a lot of red herrings. The students did not suggest this diagnosis as a possibility and all but one of them thought very strongly of luetic cardiovascular disease. They mentioned a number of things which Dr. Flink has already dismissed. I think it is important that the students clearly understand why he does not consider syphilis to be an important factor in this man's demise.

DR. FLINK: I intended to discuss it a little more. For one thing, he does not have any calcification in the root of the aorta. I didn't know that and the protocol doesn't say so, but we see no evidence of it on x-ray. The protocol does call attention to some ectasia of the

aorta but that is not enough to make a diagnosis of luetic aortitis. There is a complete absence of any suggestion of aortic regurgitation. If lues were the cause of his illness, significant aortic regurgitation would be necessary as a cause for his heart failure. The pulse pressure was not increased on multiple examinations. He did have a Grade 2 systolic murmur but a diastolic murmur was never described. You might say that he could have had an aortitis, associated with an aneurysm, with embarrassment of the circulation through the coronary ostia, but this is improbable.

DR. ZIEVE: You led up to the implication that he also had secondary coronary artery disease. Would you care to elaborate on that point?

DR. FLINK: Yes. Hypertension of any cause may be associated with coronary artery disease.

MEDICAL RESIDENT: Was there any family history of cardio-vascular disease?

DR. NESBITT: No.

DR. FLINK: Was there anything to suggest the presence of neurofibromata?

DR. NESBITT: No. A peculiar generalized dusky hue was noted in the skin, however, even during those periods when the patient was not cyanotic. As Dr. Flink has already suggested, the patient was felt to have chronic hypertensive cardiovascular disease during his multiple admissions here.

Doctor Flink's Diagnoses

1. Pheochromocytoma
2. Secondary hypertensive cardiovascular disease
3. Congestive heart failure
4. Portal cirrhosis of the liver

Pathologic Findings

DR. GLEASON: At autopsy there was no ascites, edema or jaundice. However, there were 500 cc. of fluid in the left pleural cavity and 200 cc. in the right pleural cavity. That was somewhat unusual. If the pleural fluid is not largest in volume in the right side, it is almost always due to something other than simple congestive heart failure. In this man there was more fluid on the left side.

The heart weighed 725 gm. Differential weights were as follows: left ventricle, 300 gm.; right ventricle, 150 gm.; septum, 100 gm. Therefore both ventricles were enlarged. There was only minor atherosclerosis of the major coronary arteries and no scars were visible in the myocardium. All the valves were normal, as was the root of the aorta. The left lung weighed 700 gm. and the right lung 950 gm., both being much heavier than normal and both being very wet. Much frothy fluid was expressed from the cut surfaces. The spleen weighed 100 gms. The liver weighed 1,950 gm. and was markedly "nutmegged" in character. There was a scar just past the pylorus which was suggestive of an old healed duodenal ulcer. The right kidney weighed 200 gm. and the left kidney 275 gm. Grossly, there was a small

amount of fine pitting on the surfaces of the kidneys, but they were otherwise normal. The abdominal aorta was moderately atherosclerotic in its lower abdominal portion. The adrenals appeared normal. The remaining gross autopsy examination was essentially normal. Permission for examination of the brain could not be obtained.

On microscopic examination, there was slight thickening of individual myocardial fibers. There was a tiny amount of fine fibrosis also noted throughout the myocardium. The kidneys were surprising in that they showed very little evidence of hypertension. There was some hyaline atherosclerosis and moderate intimal thickening of the larger intrarenal vessels but nothing that was not consistent with the patient's age. The lungs were congested and there was a small amount of precipitated protein material in the edema fluid in the alveoli. There was a small amount of early bronchopneumonia. The adrenal was considered normal at the time of autopsy, when it was sectioned in a few places before being placed in the formalin fixative. However, at the time of further sectioning of both glands in the preparation of material for tissue slides, a small tumor was found inside the substance of one of the glands and this seemed to be located within the medulla. On microscopic examination, the cortex was markedly thinned and compressed by this tumor, which is made up of cells that resemble those of the adrenal medulla (Fig. 1). This is a pheochromocytoma and it is apparently benign. It is very small, measuring about 1 cm. in diameter on the slide. It is not a cortical adenoma. At the time of preparation of the tissue slides, a portion of the fixed tumor tissue was taken out of formalin and subjected to the silver staining process used for carcinoid tumors. The tumor cells took up a small amount of the silver in the form of tiny granules. This silver stain for carcinoid tumors will stain the epinephrin-like material of pheochromocytomata in fresh tissue, but is not usually effective in material that has been fixed very long in formalin. I think we were lucky to get a lot of silver staining here (Fig. 2). Another characteristic feature of a pheochromocytoma, like some carcinoid tumors, is an affinity for chromium salts. Recent work has shown that both types of tumors secrete vasoactive amines, 5-hydroxytryptamine (serotonin) being elaborated by some carcinoid tumors and catecholamines (epinephrin and norepinephrin) being elaborated by functioning pheochromocytomata. These amines, or their precursors, are probably responsible for the cytoplasmic argentaffin and chromaffin granules seen in these tumors. In order to demonstrate the chromaffin properties of this tumor, we would have had to suspect its presence beforehand and fix it in a modified Zenker's solution, containing chromium salts. This is not a routine procedure.

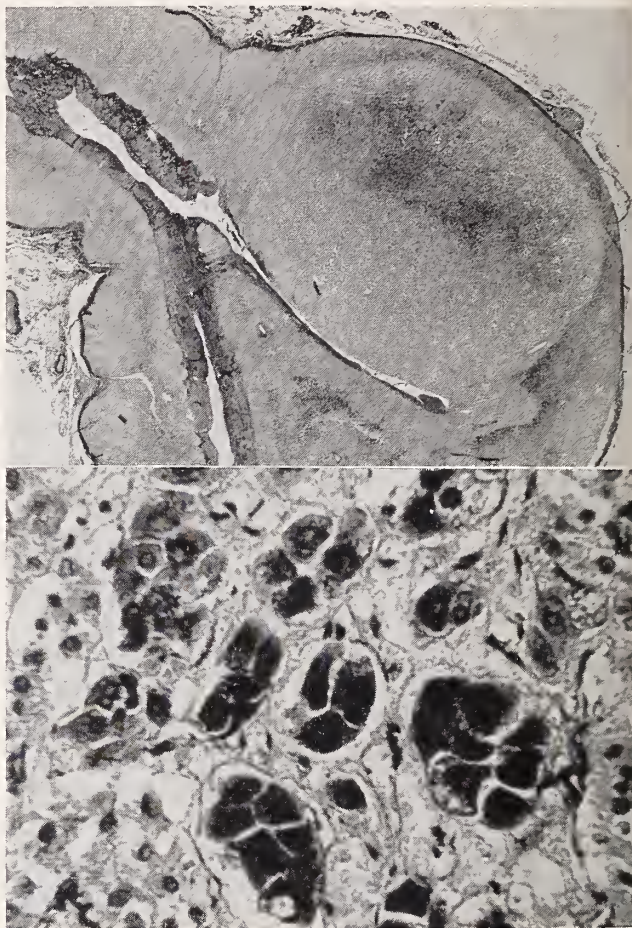
Section of the liver showed a minimal portal cirrhosis and some congestion in the center of the lobules.

Tumors of this size have been reported as being associated with hypertension. We asked Dr. E. T. Bell about it and he has seen several of this size. We feel strongly that this tumor was the cause of the patient's difficulty.

MEDICAL RESIDENT: I wonder if a BMR was done. I remember a case of pheochromocytoma that was picked up because of the results of this test.

DR. ZIEVE: Yes, but that would have been worthless in this case. He had congestive failure and the associated dyspnea would invalidate the procedure.

DR. FLINK: It should be noted, however, that per-



GOMORI SILVER STAIN OF ADRENAL

Fig. 1 (above) Small pheochromocytoma located next to intraadrenal vein and compressing cortex.

Fig. 2. (below) Section of tumor magnified 440 \times and demonstrating intense argentaffin staining of cytoplasmic granules. Photographs by Medical Illustration Service, VA Hospital, Minneapolis.

sistent hypermetabolism without hyperthyroidism should make one suspicious of a pheochromocytoma. As a matter of fact, a pheochromocytoma may be wrongly diagnosed as hyperthyroidism because of weight loss, sweating and hypermetabolism. The statement is made in the literature that the size of the tumor has little relationship to its manifestations. I don't know how small the size can be for that statement to be valid. I was ready to look for a trap door when you said the adrenals appeared normal (*laughter*).

MEDICAL RESIDENT: What would the surgeon do when he saw that normal appearing adrenal?

DR. FLINK: The patient would have to be explored from an anterior approach and the adrenals examined bilaterally. If the diagnosis had been suspected and the

proper tests were positive, then the surgeon would have to look very carefully. He might have to look in other areas. He might be misled and not take out the adrenal, even with positive benzodioxane, regitine and histamine tests. I think that in the periods of his low blood pressure, it would have been worthwhile to do a histamine test on this patient. In retrospect, all three tests should have been done, of course. The measurement of the twenty-four-hour urinary excretion of catecholamines is an even more important test to perform.

MEDICAL STUDENT: When these tumors are multiple, do they ever occur elsewhere, without being present in the adrenal? Do they occur in the carotid sheath or anywhere along the sympathetic chains?

DR. FLINK: Multiple pheochromocytomata occur most commonly in both adrenals. There is no reason why they cannot occur in other chromaffin tissues, however. When they occur in both adrenals, a portion of the cortex can be saved so that the patient does not develop adrenal cortical insufficiency. Again, the anterior approach for seeking these tumors is advisable, since one can examine both adrenals, the gland of Zuckerkandl and the peritoneal cavity and retroperitoneal areas. When the tumor is extra-adrenal in position, the problem is very much greater, of course. This patient's very small tumor reminds me of a patient at the University Hospitals who had positive benzodioxane,

regitine and histamine tests and yet no tumor was found on exploring the adrenals. This leaves one with a very uneasy feeling.

DR. SMITH: I would like to ask the pathologist to review the pathologic classification of tumors of the adrenal medulla. Is it a functional or an anatomical classification?

DR. GLEASON: Given the location in the adrenal, pheochromocytomata have a fairly characteristic morphology. This benign one looked much like the adrenal cortex except that the tumor cells were granular instead of vacuolated. The malignant pheochromocytomata may be much more variable.

Final Anatomic Diagnoses

1. Pheochromocytoma with hypertension
2. Myocardial enlargement and congestive heart failure
3. Minimal portal cirrhosis

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MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Minnesota License of Washington Physician Revoked for Drug Addiction

The Minnesota State Board of Medical Examiners on November 8, 1957, revoked the medical license held by Dr. Orin P. Thorson of Bremerton, Washington. Dr. Thorson was found guilty by the Board of habitual indulgence in the use of dilauid and morphine sulphate. After evidence was presented to the Board that Dr. Thorson had issued prescriptions for morphine sulphate for his personal use at a time when he did not possess a valid Federal narcotic tax stamp, Dr. Thorson admitted the truth of the charges in the citation that had been issued by the Board in his case. Dr. Thorson had also been charged with issuing numerous prescriptions for dilauid for patients who, pursuant to his instructions, had the prescriptions compounded at various drug stores in the State of Washington and then delivered the dilauid tablets to Dr. Thorson, who then removed part of the dilauid tablets for his own use and substituted non-narcotic drugs therefor.

Dr. Thorson's Minnesota medical license has been previously suspended twice by the Minnesota State Board of Medical Examiners for drug addiction. On May 14, 1948, Dr. Thorson's license was suspended for a period of three years and on February 14, 1952, the Board suspended his license for five years. When the suspension of Dr. Thorson's medical license expired in February, 1957, the Board learned that he had again been the subject of an investigation by agents of the Federal Bureau of Narcotics in the State of Washington, whereupon the present proceeding for the revocation of his license was instituted. Dr. Thorson, who was born at Madison, Minnesota, on September 4, 1900, received his M.D. degree from the University of Minnesota on June 11, 1928. He was licensed by examination in Minnesota in 1927 after obtaining his M.B. degree. Dr. Thorson was engaged in the practice of medicine for twelve years at Northfield, Minnesota, before moving to Bremerton, Washington, in 1940.

License of Minnesota Physician Revoked for Misconduct

On November 8, 1957, the Minnesota State Board of Medical Examiners revoked the medical license held by Tauno E. Ketola, M.D., 29 years of age, who practiced medicine for a short time in 1956 at Cloquet, Minnesota. Dr. Ketola was present at the hearing and admitted the truth of the charges contained in a citation for the revocation of his license which had been issued by the Board on July 16, 1957. Dr. Ketola was charged in the citation with conducting himself as a licensed physician and surgeon immorally, dishonorably and unprofessionally in that he had committed immoral, improper and indecent sexual acts with more than eleven persons of the male sex between 1953 and February, 1957. There was no evidence that any of these persons had ever consulted Dr. Ketola as a patient.

Dr. Ketola, on April 15, 1957, had entered a plea of guilty before the Hon. Mark Nolan in Carlton County District Court to an information charging him with the crime of sodomy. The charge had been filed against Dr. Ketola because of his misconduct with boys who were minors. Judge Nolan continued the case for a pre-sentence investigation and ordered Dr. Ketola to undergo a psychiatric examination. After he had been hospitalized and given psychiatric treatment, Dr. Ketola again appeared before Judge Nolan on October 3, 1957, at which time the Court continued the matter for one year when the case will be reviewed and Dr. Ketola will be sentenced.

Dr. Ketola, who was born in Iron, Minnesota, on July 6, 1928, graduated from the University of Minnesota with an M.D. degree on June 13, 1953. He was licensed to practice medicine in Minnesota in the following month and subsequently he served an internship for one year at the Highland Alameda County Hospital in Oakland, California. In May, 1956, Dr. Ketola was separated from the United States Air Force for similar misconduct.

Editorials

JOHN F. BRIGGS, M.D.
ARTHUR H. WELLS, M.D.
HENRY G. MOEHRING, M.D.

GOVERNMENT

I am happy to accept the invitation to write a series of editorials on "Government" for MINNESOTA MEDICINE. I regard it as an opportunity to perform one of the important functions of my office—that is, to use every available means to bring about a greater understanding of the problems of government on the part of the people of our state.

There are some significant differences, and some important similarities, between the practice of the science and art of medicine and the science and art of government. The medical profession requires great ability, as well as long, arduous, specialized training. It requires constant and alert attention to the latest scientific advances. Facts, information, and understanding are of utmost importance.

The medical profession makes use of its great scientific development to contribute to the health and happiness of human beings. Its goal is not the amassing of skill and knowledge as an end in itself, but rather as tools to use to relieve human suffering. And therefore members of the medical profession must understand the needs and wants of the individuals whom they serve. The art of healing and the science of the prevention of disease are of utmost importance to human welfare.

What can we say about government? By some, it is regarded as "a necessary evil," but this concept is not only frivolous but totally wrong. Human beings could not live in the world of today without government, and nothing that is essential to human society can be regarded as evil in itself. To be sure, there are some governments in the world today—as there have been in the past—which we regard as evil in their methods and goals. And perhaps there is no government in which some evil cannot be found. But in a free, democratic government such as ours, the responsibility for serious faults must lie, in the last analysis, with all of the people.

Government, like medicine, is dedicated to the welfare and happiness of human beings. True, physicians deal primarily with individuals, while

government deals with individuals in their relationships with each other. But medical science must also consider human relationships. It cannot set standards for a pure water supply, or prevent epidemics, by dealing with individuals alone. And government must consider the dignity and worth of each individual human being if it is to maintain the freedom to which we in the United States are so thoroughly committed.

But if government and medicine are similar in their common dedication to human welfare, what about other characteristics? Those who engage in the medical profession are highly trained and carefully selected for aptitude and ability. What can be said for those who engage in government?

Many are, of course, extremely able and well trained. Government today has become complicated and specialized, and must seek out and secure the services of well qualified men and women. But it is an essential part of our democratic philosophy of government that those who hold the policy-making positions in government must be elected by the people. For such officials, the absolutely necessary qualification is their ability to secure the majority of the votes. In the final analysis, then, every voter not only shares in the government, but must be held responsible for the wisdom of the choices he makes.

Good government, therefore, depends not only on the ability and integrity of those whose principal occupation is in government, but also on the ability and judgment of the people. It requires not only an intelligent and educated electorate, but one that is adequately informed on public questions. The decisions that voters must make involve questions too complicated to be solved by slogans and shibboleths. They require a real understanding of the problems involved.

ORVILLE L. FREEMAN, *Governor*

IRON METABOLISM

Iron is an essential constituent of hemoglobin, myoglobin, and certain respiratory enzymes such as cytochrome and catalase. It is thus intimately concerned with tissue respiration. Because of the

body's need for iron, provision must be made for its absorption, transport, storage, and perhaps also for its excretion.

That there is more iron in blood than can be accounted for by the presence of hemoglobin alone was suggested as early as 1872. The presence of iron in normal human serum, however, was not established definitely until 1927. Normal human serum contains from 60 to 180 micrograms of iron per 100 cubic centimeters. In the serum, iron is bound to a beta-1-globulin, siderophilin. Normal serum contains a sufficient amount of siderophilin to bind approximately 300 micrograms of iron per 100 cubic centimeters. The normal iron-binding capacity of serum is therefore approximately one-third saturated. Serum iron is transport iron, i.e., iron which is on its way from the intestinal tract to storage sites, from storage sites to hematopoietic tissues, or from sites of blood destruction back to storage sites. Serum iron is a dynamic fraction, showing considerable variation throughout the day in a given individual as well as from day to day.

Iron is absorbed from the intestine principally in the ferrous state. Because food iron is mainly in the form of insoluble ferric salts, food iron must be brought into solution and reduced before it can be absorbed. While hydrochloric acid of the stomach is probably of some importance in bringing ferric iron into solution, the reducing substances in the gut such as vitamin C and glutathione are of considerably more importance in iron absorption. Absorption occurs mainly in the duodenum and upper jejunum. There is evidence to suggest that the absorption of iron is regulated, in part, by the body's need for this element. Urine, bile, and sweat each contain small amounts of iron. The total amount of iron excreted in this manner amounts to less than 1 milligram per day and is not increased when iron intake is increased. The body thus possesses no regulatory mechanism for the excretion of iron. Women lose an additional 20 to 50 milligrams of iron with each menstrual period.

Another important factor in the regulation of the serum iron level is the balance at any given moment between blood destruction and new blood formation. Normal blood destruction accounts for the release of approximately 25 milligrams of iron each day, and this must be transported back to the marrow for new blood formation. Nor-

mally, of course, destruction and formation are in balance although at any given moment it is likely that one or the other may be proceeding at a higher rate. In certain disease states, this balance is disturbed. When blood formation is decreased to a greater degree than blood destruction as, for example, in aplastic anemia, the serum iron will be high. On the other hand, when the rate of blood formation is relatively faster than that of destruction, as in iron deficiency anemia, the serum iron will be low.

For reasons that are not well understood, infection seems to result in an increased demand for iron by the normal storage sites, that is, the liver, spleen, and bone marrow. Because of this demand, the serum iron is usually low in the presence of infection even in the absence of anemia. An exception to this general rule is hepatitis which is usually characterized by a high serum iron. This is thought to be due to the release of iron from damaged liver cells.

The normal adult male body contains approximately four to five grams of iron. Of this, almost 60 per cent occurs as hemoglobin iron, approximately 20 per cent as the iron of myoglobin and the respiratory pigments, and the remaining 20 per cent as storage iron. The iron of myoglobin and the respiratory pigments is inviolate; that is, it cannot be used for the manufacture of hemoglobin even in the presence of severe iron deficiency. On the other hand, stored iron, which is present in the liver, spleen, and bone marrow, is a very mobile fraction and can be used readily when there is excessive iron loss or insufficient iron intake. In the management of iron deficiency anemia, the necessity for replenishing the depleted iron stores is all too frequently overlooked. Iron therapy is often stopped too early with the result that the anemia recurs.

Perhaps the most interesting disturbance in the metabolism of iron is hemochromatosis, a condition characterized in its fully developed form by widespread hemosiderosis, cirrhosis of the liver, diabetes, and bronzing of the skin. Since, as has been pointed out above, the body has no mechanism for the regulatory excretion of iron, hemochromatosis must represent a disorder of iron absorption. Considerable evidence suggests that the disease actually begins very early in life, long before symptoms are manifested. In recent years, encouraging results have been obtained in

the treatment of this disorder by removing large amounts of iron from the body by means of repeated venesection.

Iron is an essential constituent of the body. Disorders of iron metabolism can be treated most rationally when its metabolism is well understood.

ROBERT B. HOWARD, M.D.

CALENDAR HISTORY

The Twin Cities have the largest per capita distribution of calendars and the West Coast the largest distribution per capita for area. The largest religious calendar orders originate in New York City.

Brown & Bigelow furnishes subject matter for every kind of business and industry. It produces 600 paper items in addition to 200 metal, plastic and leather advertising novelties. It turns out eight million decks of playing cards annually.

From a one-room operation in 1896 with one of the partners, Bigelow, its lone salesman, the Brown & Bigelow company has grown to a huge operation with vast plants in St. Paul and Minneapolis. Its 1,100 salesmen, working out of fifty-nine district offices, cover the entire country. It has hundreds of representatives in foreign countries.

This vast operation has been built principally on the need for a device with which people can keep track of the days, months, and years—the calendar.

With emphasis on developing quality and beauty in the calendar line, Brown & Bigelow has brought the product a long way from the simple reproduction of figures which tell the day.

The pad of dates hanging on the wall serves its function but has little glamour. A businessman wishing to carry a message to this customer or prospect, via the calendar he distributes, is anxious to make an impression.

As result, Brown & Bigelow has enhanced its calendar pad with illustrations of the finest works of nationally-known artists. This results in real advertising pull for the merchant.

In addition, certain types and subjects are given to specific businessmen under a franchise so that year after year his firm and product are identified with the calendar he sends out.

For instance, the Boy Scout calendar published exclusively by Brown & Bigelow for thirty-three years is one of the best in the line. Illustrated

by Norman Rockwell, America's famed artist, this calendar is specifically designed for public places, Boy Scouts, Cub Scouts and parents. In its various editions, this piece fosters co-operation with the Boy Scout movement and is designed to develop good citizenship.

The national organization of the Scouts receives royalties on each one of these calendars sold by Brown & Bigelow. This official Boy Scout calendar is given under franchise to a merchant who may have exclusive right to its use in a specific territory.

The 4-H club calendar is published under similar arrangement with royalties going to support the national 4-H camp.

The calendar carrying a portrait of the Dionne quintuplets painted exclusively for Brown & Bigelow was a popular item. This series was discontinued after the death of one of the quints.

Although early American calendars were designed specifically for hanging in offices and public places, the trend toward home calendars has given impetus to the development of the calendar business.

A national independent survey has disclosed that a housewife averages two calendars in the home but is looking eagerly for more. Those questioned merely sought additional variety and said that if they were given the choice of more subjects, they would gladly accept them for home use.

The attention-getting quality of this home necessity was proved by housewives when queried at their doors. They were able to recall the advertisers' names on 78 per cent of all the calendars hanging on walls or placed on desks and tables about the home.

In this still wide-open field, Brown & Bigelow keeps growing. It continues to develop quality along with quantity. New types of calendars, new illustrations, new sizes and new utility features are introduced each year to make the calendar as much a functional part of every room as the very wall itself.

JOSEPH H. SUMMERS
Brown & Bigelow

SAFETY GLASS AND YOUR CAR

Safety, in respect to the glass areas in your car, starts with the finest quality of glass—safety plate glass. In addition to the physical protection af-

Second in a series of three editorials on safety glass.

MINNESOTA MEDICINE

forded the occupants in case of accident, it involves the quantity of vision—how expansive a field of view is provided.

Educators who teach people how to drive safely agree that a wide visual field is a prime requisite in accident prevention.

The area one can see from side to side while looking straight ahead is called your field of vision, according to the driver training textbook of the American Automobile Association. There are standard tests for peripheral vision and the average person can see a 180 degrees field. Some even cover 195 degrees and more. However, there are a few persons who have "tunnel vision." They see only straight ahead, as if looking through binoculars. Necessarily, they are at great disadvantage when driving through intersections and at all times in heavy traffic.

Older motor cars with narrower windshields, divided strips down the center, and prominent forward corner posts, gave every motorist some of the characteristics of tunnel vision.

However, with the advent of the panoramic windshield, a few years ago, the tunnel view is pushed aside by a much wider windshield of greater area, with corner posts moved back and obstructions in the windshield itself removed.

For instance, the area of windshields in current models of the Chevrolet car are now 67 per cent greater than those of the 1947 model. Much the same trend has been shown in all other General Motors cars and many other popular makes.

Another move to increase the quantity of vision has been the enlarging of backlights. In the 1957 Chevrolets the backlights are 180 per cent larger than they were ten years ago.

Taken together, the big back windows and the large panoramic windshields benefit other drivers as well as you when seated in the driver's seat of your own car. The man in the car behind, can see right through your car and take in much of the area ahead of you. In some situations one may see through two or three cars ahead and for some distance through cars at the rear. The more warning a driver has, the less chance there is for accident.

Large rear windows also provide a safety factor for backing out of a driveway.

To prove up the safety advantages of a more expansive view, one needs only to compare specific

views from the modern car with the same views from the finest cars produced ten years ago. Not only have the seeing areas become larger but the engineers have designed the car itself to employ these windows to the best advantage for the driver.

The greater efficiency of vision embodied in the panoramic windshield was not achieved without a struggle. It took ten years of research work to bring this product to production. The first of the panoramic windshields were installed in 1954 models of Cadillac, Buick and Oldsmobile cars. Libbey-Owens-Ford Glass Company (largest manufacturer of automotive safety glass) began its investigations of curved glass in automobiles in 1941. In 1943 they engaged the late Dr. Adelbert Ames, Jr., and Dr. Kenneth N. Ogle, of the Dartmouth Eye Institute, to assist in the research. Their studies found that one specific type of windshield curvature would increase the comfort and safety of the driver even over the flat windshield then in use. That gave the manufacturers their cue. However, whenever curved glass is introduced into the field of view, quality of vision must be carefully assessed. Car manufacturers followed this investigation closely over several years and many changes in styling and body design were effected merely to preserve the best optical effects in the new curved windshields.

Most important result of all the factory research was an exclusive Libbey-Owens-Ford method of manufacture which costs more but produces a superior panoramic windshield.

In a less expensive process, one starts with a flat block size of $\frac{1}{8}$ -inch glass cut to a curved pattern. Then the patterned shapes are bent under heat to the finished curvature. In the Libbey-Owens-Ford process the rectangular block sizes are first bent to curvature under heat and the trimming of the peripheral waste glass is done later. It was early discovered that it was in the peripheral area of the glass adjacent to the mold supports where uneven bending caused distortion and gave poor optical results. Yes, the two processes turn out products which fit the testing templates but only the latter process brings forth a windshield that also provides all-over superior optical results for the car driver.

WILFRID HIBBERT

Libbey-Owens-Ford Glass Company

CONFESSIONS OF A HOBBYIST

Baking

Some five years ago, while mixing the ingredients for a photographic formula, it occurred to me that it shouldn't be hard to mix cooking ingredients. After poring over a couple of cookbooks, I wasn't so sure. Expressions like "Beat until light," "Fold in the whites," and "Cook until done" seemed to me a bit vague. Then I got hold of Betty Crocker's Picture Cookbook, and light began to dawn. Not only were there pictures of how to do things, but there were precise measurements, and precise information about temperatures and times. That was right up my alley, and I got busy and made two loaves of white bread. It was good, too! It was a short step from this to cakes and pies, and I tried nearly every cake and pie in the book. The payoff came when my daughter asked me to make her wedding cake. I set up a pilot plant, so to speak, and made a small one, and when this came out all right, got busy with the big, three-story cake. It had a priming coat of one kind of frosting, and a finishing coat worked into patterns with a squirt-gun. Since it uses eighteen egg whites, the eighteen yolks had to be made into cupcakes. We got tired of cupcakes!

Pies are real fun. The only difficulty in making good piecrust is getting the water mixed in evenly, and I fixed that by putting my four tablespoonfuls of water in a pop-bottle with a five-cent aluminum sprinkler cork. Chiffon pies are complicated to make, but are delicious, and well worth the trouble.

I'm not interested in cooking on top of the stove. The utensils are too hard to clean up, and besides, if I got good at it, I might have to take over. I shouldn't know how to cook a lamb chop, even if I had money enough to buy one. I admit without shame that if left alone, it is simpler to get a package of corn-flakes and some cream. Once I did make eight quarts of watermelon pickle, and came to grief, not knowing that the boiling point of vinegar, sugar and water, suddenly changes when the mixture boils down. Without warning, the whole thing went WHOOSH—and the innards of the stove aren't cleaned up yet.

I do put up a lot of cranberry sauce, because

my relatives in the East raise some 10,000 barrels of the things every year, and send me a large box of an especially fine variety. Outside of this, as far as I am concerned, baking is real fun, but stove-top cooking—NO.

JOHN DEQ. BRIGGS

CAN YOU BE INSURANCE POOR?

The Young Physician

From what the life underwriter hears, just about everyone must be "insurance poor." In many instances a man says he is in order to divert the interview, but there are occasions when an individual is paying more for insurance of one type or another than is practical, assuming this is what is meant by "insurance poor."

Many individuals could be said to be "insurance poor" for another reason—not because they own too much coverage, and not because their premiums are too high in comparison to income, but because their premium dollars are not being applied wisely to cover their needs.

For example, recently a young physician rejoined his family after a two-year confinement for tuberculosis. He is currently finishing his last year of residency, which was interrupted two years ago. Unfortunately, for many years to come his application for life insurance will be rejected, or if not rejected, premiums will be rated high and benefits will be limited. Previous to his illness he had purchased \$15,000 of permanent life insurance including Waiver of Premium for Disability, carrying a premium of approximately \$400 per year. His life insurance premiums were waived during his illness, but he had no disability income.

This young physician, like others in special fields, has \$40,000 to \$50,000 invested in the cost of his education and deferred or lost earnings. It is said that there are two ways for a physician to protect his investment: (1) to live and maintain good health while applying it in his practice or (2) to insure. Because he cannot determine how long he will live and be able to practice, the only means available to protect his investment is to insure, with both life and disability insurance.

A prominent insurance educator has advocated that an insurance buyer determine how much insurance is needed to do the job intended, and that he pay as much premium as he can afford for that coverage. The amount of premium will determine

the type of insurance. For the young professional man (with limited income and seemingly unlimited needs for income) this will require the use of a high percentage of term insurance until income permits more substantial premiums for permanent insurance. It is more attractive, in some ways, to use the limited premium to buy a smaller amount of permanent insurance, recognizing that all or a portion of the premiums paid can be refunded as cash value if the policy is terminated. Furthermore, the interest on the cash values will reduce the actual cost of the insurance over a period of years. Many individuals will be lucky enough to complete their insurance program on the basis of purchasing smaller amounts of permanent insurance periodically. That was not the case with the young doctor just described. He based his planning on the premise that he would be insurable when he decided to expand his program and that quite likely he would not die or be disabled before he completed his program.

It appears that this young physician could be said to be "insurance poor" because he needs and could have owned more protection for his \$400 per year. To illustrate: for the \$400 per year it would have been possible for him to purchase a combination policy carrying \$10,000 permanent insurance and \$30,000 of term insurance, with a rider providing for waiver of premium and disability income benefits for total and permanent disability.

If this physician had used this plan he would have protected his investment for the benefit of his family in event of premature death and for himself in event of disability. Also, he would have preserved the right to expand his permanent insurance up to \$40,000 by use of the conversion privileges on the term insurance, regardless of health at a later date.

Would owning this plan make him "insurance poor"? It is obvious the latter course of action would have been the correct "corridor in the maze," the more advantageous alternative. You might say that hindsight is much better than foresight. You might say that this doctor's misfortune was a remote possibility. But you could say, also, that it is the remote possibilities for which we insure.

HERBERT F. MISCHKE, *C.L.U.*

DEFINITION OF THE TUBERCLE BACILLUS

A Bacteriologist's Definition.—The tubercle bacillus (human, bovine and avian types) belongs to a parasitic branch of the family of mycobacteria whose non-parasitic branches are widely distributed in the soil. Mycobacteria belong to the order of Actinomycetales, which includes the families of Actinomyces, Streptomyces and Nocardia—the members of which have a complex life history:—a generation of rods interchanging with a mycelial generation, each with their own mode of reproduction. Mycobacteria and Nocardia are now known to have a common ancestry.

The parasitic branches of the family of Mycobacteria occur and reproduce as rods. Only the tubercle bacillus of the avian type, if grown in culture, may show a *reversion* to ancestral forms of growth and reproduction. The life history of mycelial avian strains shows a development in stages from *non-acid-fast* mycelial structures to colonies of acid-fast bacillary rods and filaments. From different branches of the same mycelium colonies of the "non-orientated," the "orientated" type may arise. This family history explains the "pleomorphism" often seen in ordinary cultures of avian type bacilli.

In the human and bovine type, reversion to the mycelial growth habit may also occur (*in vivo* as well as *in vitro*) but is rare. However non-acid-fast filaments and rods may precede an acid-fast generation. Colonies of "non-orientated" and "orientated" type (cords and ropes) are a common occurrence and can be explained, in view of the developments in mycelial avian strains, by the family history of the mycobacteria.

While in culture as well as in animal tissues, at the time when infection had become established, the human tubercle bacillus seems to reproduce as bacteria do, there are certain differences and the question of the reproductive processes in the *invasive* phase of infection is still a matter of controversy.

A Cytologist's Definition (from observations with the electron microscope on fixed specimens).—A typical rod-shaped tubercle bacillus resembles ordinary bacteria in its finer structure. It consists of a protoplast enclosed in an outer cell wall. The protoplast has a plasma membrane which lies just inside the cell wall and which

has been shown to possess a number of enzymes, including those necessary for cell division.

The cytoplasm is granular, as in other bacteria, and contains a number of characteristic structures or organelles such as: (a) one or more larger granules which appear sharply defined and very dense in the electron microscope, due to their high content of metaphosphates (which have a possible function in energy metabolism); (b) oxidative-reductive enzymes which in animal cells are associated with the mitochondria and which in the tubercle bacillus are distributed throughout the cytoplasm apparently not associated with structured organelles; and (c) the nuclear apparatus, which is similar to that of ordinary bacteria, and consists of networks of coiled fibrous material, which is supposed to contain the genetic material of the cell.

The division of the rods normally occurs by the formation of a cross wall and the separation of the two daughter cells, each containing part of the nuclear apparatus. Some rods, however, grow into filaments and a different reproductive process takes place in which rows of intracellular units form within the bacillus. Each unit has its own limiting membrane and the process is suggestive of spore formation.

Mycelia in avian strains are found to be formed from chains of individual cells which reproduce by crosswall formation and also by budding, the buds arising from bulges in individual cells.

A Pathologist's Definition.—A pathologist would define the tubercle bacillus as the causative agent of tuberculous disease. It has the ability to multiply in the tissues of a susceptible host and causes a specific tissue response: tubercle formation, necrosis and caseation.

In tissue culture, bacilli also multiply freely in macrophages, with both partners living together apparently unharmed for shorter or longer periods until the growing cluster of bacilli disrupts the cell. But contrary to growth *in vivo* there is no specific tissue response, no sign of tubercle formation, no toxic action and no caseation. Furthermore, bacilli multiply in macrophages of tissues from animal species which are known to possess a native resistance to infection.

The clue to the definition of the tubercle bacillus as a parasite and its pathogenicity may well lie in the difference between the host-parasite relationship in the *in vivo* and *in vitro* infection.

A study of the life history of the tubercle bacillus in its parasitic existence, now in progress, will throw more light on the problem of pathogenicity.

E. M. BRIEGER, M.D.
Strangeway Laboratory
Cambridge, England

SIMPLE REVERSIONARY TRUST

One of the physician's most pressing financial problems today is his high Federal Income Tax.

He would like to reduce it without reducing his earnings . . . and while this seems like "pie-in-the-sky," it can be done through the use of a simple reversionary trust with the income payable to and taxable to the beneficiary.

For years, trusts have been widely used for tax and other purposes. The reversionary trust is relatively new, however, and trusts that transfer the tax liability to the beneficiary are downright rare.

The reversionary trust differs from the standard trust in that the corpus (body) of the trust reverts back to the donor after a period that cannot be less than ten years.

This enables an individual who does not need the income from certain investments to divert that income to a beneficiary for a period of not less than ten years, and, after that time, to receive back his original investment.

Then, if the trust is properly drawn, the beneficiary is also made responsible for the tax which can mean the difference between a minimum 20 per cent tax which the trust would ordinarily pay and no tax at all because of the beneficiary's normal tax exemption.

Thus, the simple reversionary trust becomes one of the most effective legitimate opportunities for a doctor, temporarily, to shift to others some of his investment income, and, more important, also the tax burden that goes with it.

Ideal for Parents

This simple reversionary trust is ideal for parents with young children who will later go to college and for those with dependents with little or no income of their own.

For example, on an investment yielding \$500 annually, a physician in the 50 per cent bracket would have to pay \$250 tax . . . but his son or daughter would not have to pay any tax at all

if they received the \$500 and didn't have too much other income.

Since any taxpayer can have taxable income up to \$675.00 without having to pay any Federal Income Tax, and because \$50.00 of the dividend income would be nontaxable, the annual dividend income to the beneficiary could be up to \$725.00 per year, reduced by income from other sources, if any, without his having to pay any Federal Income Tax.

If the beneficiary is a child under nineteen (or a child in school, regardless of age) and one furnishes over one-half of that child's support, one would not lose the dependency exemption for that child because of the trust income. However, if the beneficiary is an adult dependent other than the above, then it is recommended that the beneficiary's gross income from all sources be less than \$600.00 per year to prevent loss of dependency exemption.

Here is a table showing how much more one would have to invest or how many times the rate of return one would need, to accomplish results equal to this trust.

If Tax Bracket is	Earnings necessary to clear \$600.00 after Federal Income Taxes	(Without Trust) Number of times investment principle must be increased to clear same as with Trust (up to \$600.00).	(Without Trust) Number of times the rate of return (of Trust) must be increased on a specified investment to clear the same amount (up to \$600.00).
30 %	857.14	1.42	1.42
40 %	1,000.00	1.66	1.66
50 %	1,200.00	2.0	2.0
60 %	1,500.00	2.5	2.5
70 %	2,000.00	3.33	3.33
80 %	3,000.00	5.0	5.0

What to Use as Corpus of Trust

Practically anything can be used as the corpus or body of a reversionary trust. A mutual fund is very suitable as it provides a broad investment program in one security under the supervision and management of professional analysts. It is simple to use in a trust and since most funds are composed largely of common stocks, it also provides a hedge against inflation.

The value and dividends on the shares will increase or decrease with changes in market value and income of the investments in the fund, of course, but the management has the responsibility of managing the fund to meet changing conditions, to the best of its ability.

This is very important since a reversionary trust must run a period not less than ten years.

How Much to Put in Trust

A trust can be written with a corpus of any amount from \$1 to 1 million dollars, or more. It all depends on how much income is to be diverted to the beneficiary. However, there is usually a minimum charge made for the administrative work of the Trust Officer (usually \$25 or \$50 annually depending on locality and the policy of the bank) and therefore trusts of at least \$5,000 would seem advisable.

But whatever amount is used, the donor should proceed with care as any investment that results in lower taxes is usually carefully scrutinized by the Internal Revenue Department. This is especially true of a trust, such as discussed here, which makes the income taxable to the beneficiary and not to the trust.

The simple reversionary trust holds important opportunities for tax savings but all benefits can be thrown away by a wrong sentence, phrase or even a single inadvisable word in the trust instrument. This is truly a time when the phrase "investigate—then invest" is appropriate.

LE ROY B. EVANS

Dow Theory Forecasts, Inc.

DIFFUSE OTITIS EXTERNA

Following a comprehensive discussion of the differential diagnosis and etiologic relationships involved in diffuse otitis externa, the author presents details of an effective method of treatment. He advocates prompt measures to alleviate pain and to control infection, because, he states, "the commonness of pain as the presenting complaint indicates that infection is usually present when the majority of patients seek help."

The author states that in practice, treatment with an agent whose established use is confined to local application is both safe and satisfactory. His best results have been attained with a special liquid preparation—Otobiotic. This nontoxic and nonirritating topical medication which has a physiologic pH of 6.5, contains 3.5 mg. neomycin (as sulfate) and 50 mg. sodium propionate per cc. of alcoholic glycerin vehicle. The spectrum of neomycin includes a gram-negative and gram-positive organisms, notably *Pseudomonas bacilli* and hemolytic staphylococci which are the bacteria found most commonly in ear infections. Propionic acid is particularly effective against the fungi, reported present in about 25 per cent of these cases.

As a routine measure against pain, the author prescribes aspirin and codeine, or, if necessary, a more potent analgesic. He also advocates local cold applications and avoids hot applications.

Of 713 patients treated successfully by the author's method, 347 required only one office treatment; 237 required two visits; 87, three, and 32, four treatments. The remainder required more than four, but their ear conditions had been complicated by perforated drums and other effects of previous chronic otitis media. However, following application of Otobiotic, their ears became free of discharge and improvement in chronic otitis media was noticed.—LAWSON, G. W.: Postgrad. Med., 22:501 (Nov.) 1957.

President's Letter

A REVIEW OF THE YEAR

In January of this year, eleven months ago, I presented in these pages my first letter as President of the Minnesota State Medical Association to the medical profession of Minnesota. In that letter, I called attention to the fact that we are now in the second century of the existence of our great Association, meaning that for more than a century our organization had been working for the greater good and the better health of the people of Minnesota and the nation.

I also wrote that this Association has been in the forefront of medical progress and organization for many years, and I pointed out how selflessly the physicians of the state have served the interests of the organization in everything that has to do with the improvement of the health concerns of the people of Minnesota.

A year ago, I appointed members of committees which were to carry out the many and varied activities of our Association. Now I wish to thank all of you for the notable service you have rendered to the Minnesota State Medical Association and the people of our state. Not a single physician who was asked to serve on a committee or to perform any service for the solution of health problems refused to do so. This is truly a reflection of the willingness with which the physicians of Minnesota serve mankind and strive for the betterment of the health of everyone.

My second letter dealt with Medicare. I outlined the plan of the Federal Government for the medical care of dependents of men in uniform, and I set forth what was required of physicians of the state in making the plan work. I said, "The burden of making this plan succeed rests upon the physicians of Minnesota and the people generally." Thus far, at least, the plan has been successful. We all realize that in such a complicated mechanism many corrective measures have to be taken from time to time, but no major health plan of the magnitude of Medicare could function smoothly without modifications and changes. I wish to acknowledge the remarkable co-operation of the physicians of the state in helping to make this plan successful.

My third letter dealt with the role of Blue Shield in medicine. In this letter, I called attention to the exemplary work that has been accomplished by Blue Shield. I stressed the fact that the current esteem manifested toward Blue Shield by members of the profession here and elsewhere is the result of tireless efforts by a board of directors devoted to a cause. I also set forth some of the problems which face us, and I stressed the fact that members of the profession should be united in their efforts further to improve our economic progeny, meaning Blue Shield.

Requests recently have been voiced in many quarters for greater participation of individual physicians in the Blue Shield corporate structure. It has been suggested that this be accomplished by increasing the number of physicians who constitute the corporate body of Blue Shield. I explained my conviction that members of the medical profession and the directors of Blue Shield Board ought to discuss their problems around a conference table, since the question of increasing the corporate structure of Blue Shield is only one among many. I repeat now my original contention: if members of the medical profession continue to remain loyal to Blue Shield, there can be little question that we shall also continue to maintain an adequate, effective and proper voice in the economy of medical practice.

The annual Scientific Assembly of the Minnesota State Medical Association was held in Saint Paul on May 13, 14 and 15. It was a great success from many standpoints. We were addressed by outstanding national and international authorities in their particular fields of medicine. There was an excellent social program. The banquet was an impressive success, from the standpoints of attendance, menu

and afterdinner activities. Still, I think that the practice of the omission of the President's Address on this occasion (delivery of which was transferred to the General Assembly) deserves some consideration for the future. Those of us who arranged the program of the Scientific Assembly were disappointed in the rather small attendance at the scientific lectures, panels and presentations. I dealt with the problems of the Scientific Assembly and the annual convention in my fourth letter.

In another letter, I addressed myself to some of the problems which confront the Minnesota State Board of Medical Examiners, another group of fine physicians who give themselves selflessly for the improvement of standards for the practice of medicine in this state. I particularly recommend that you read this letter again, because it explains, to some extent, the legal responsibilities of each physician and the high regard in which the Hippocratic Oath should be held by each physician.

In a subsequent letter, I discussed the attempts which have been made by medical societies (the Minnesota State Medical Association, in particular) and industry, to bring about a more satisfactory distribution of physicians. This is a very important field of endeavor, because where it is successful, it inevitably improves the practice of medicine generally. I believe every physician ought to do what he can to help this eminently worthwhile project.

Later, I commended the notion of the Fifty-Year Club, saying that every physician who practices medicine long enough to become a member of that club has performed outstanding service to the people of our state. It should be the ambition of every practicing physician to live long enough to become a member of the Fifty-Year Club.

In another communication, I stressed the importance of physicians' contributing funds to the American Medical Education Foundation, so that those who follow us in the future may be assured of continuing the practice of medicine in a free-enterprise economy, and so that the people will be able to continue to consult the physicians of their choice.

Another letter afforded me the opportunity to review some efforts which I think should be made in keeping the cost of medical care down.

Finally, last month, I remarked on the problem of inclusion of physicians in the Social Security system.

In the present letter, I find myself reviewing the year as a means of taking stock and seeing what, if anything, has been accomplished during that time. I hope that by calling your attention to these matters, and perhaps inducing you to read some of these letters again, I may renew your interest in the activities of the Minnesota State Medical Association and stimulate you to come forth with offers to my successor of suggestions or measures which will improve our stature as physicians in the community in which we live, the standing of our profession as a whole, and to further those actions which are for the greater good of the people whom we serve.



President, Minnesota State Medical Association

Committee Action

Child Health Committee

*Accidents
School Health
Resuscitation of the Newborn
Retarded Children
(and other interests)*

The Child Health Committee of the Minnesota State Medical Association must, of necessity, concern itself with many aspects of the care of children. The main interests of the committee this past year have been in accidents, school health, resuscitation of the newborn, retarded children, cooperation with the Fifth Governor's Council on Children and Youth, cooperation with a Committee on Children's Diagnostic and Treatment Program, in the revision of feeding cards, in the study of neonatal deaths being carried out in Hennepin County, and in various aspects of immunization.

The interest of the committee in work concerning immunization has been shared with that of the Minnesota State Medical Association Committee on Vaccination and Immunization.

Accidents continue to be the leading cause of death among children of the ages of one year to fifteen years. Legislation was passed at the last session of the Minnesota State Legislature which will enable the Minnesota Department of Health to employ a health educator, much of whose work can be devoted to the prevention of accidents. The committee feels that when such a person has been selected, a much more vigorous and effective accident-prevention campaign can be carried out throughout the state. The committee has been working on this problem for a number of years in cooperation with the Minnesota Department of Health.

The creation of a center for the control of poisoning is another aspect of accident-prevention in which we have been interested. Dr. Tague C. Chisholm has been working on the establishment of such a center for several years. During the past year the accident committee of the Minnesota chapter of the American Academy of Pediatrics also has become interested. Dr. Robert Semsch, chairman of the Academy committee in question, with the cooperation of Dr. Chisholm, Dr. A. B. Rosenfield and others, has succeeded in establishing such a center. It is now in operation. Information about the functioning of the center has been and will be distributed by means of the *News Letter*.

Much credit should be given Dr. Tague C. Chisholm, who has worked for many years to

further the cause of prevention of accidents among children in this state.

School health is a very important aspect of the work of the Child Health Committee. One to three members of the committee have attended each of the biennial conferences on school health in Highland Park, Illinois, for the past ten years. These conferences are held on every odd-numbered year, and are sponsored jointly by the American Medical Association and the National Education Association of the United States. Dr. Robert Bergan has been the representative this year.

State school health conferences were begun in 1954, and subsequently were held in 1955 and 1956. The Minnesota State Medical Association has been one of the sponsors each time, the others being the Minnesota State Dental Association, the Minnesota Association of School Superintendents, the Minnesota Department of Health and the Minnesota Department of Education. The meetings have been held at the Center for Continuation Study at the University of Minnesota. Members of the Child Health Committee have attended and participated in these conferences, and also one of our committee members, Dr. Rosenfield, of the Minnesota Department of Health, has planned each of the meetings. It is expected that these meetings will continue to be held, but probably biennially.

Resuscitation of the newborn is a problem confronting not only those in general practice, but obstetricians, pediatricians and anesthesiologists. It is hoped that the combined efforts of the committees representing the foregoing groups can evolve a recommended standard procedure which will be of help to men practicing throughout the state.

The recognition, management and education of retarded children often constitute a difficult problem. In 1950, a nation-wide organization, the National Association of Retarded Children, was organized. Many chapters of this organization are active in Minnesota. The Child Health Committee is trying to maintain contact with them. The committee also is keeping close contact with a federally financed, federal-state study of retarded children in a nonurban area. This study is ex-

COMMITTEE ACTION

pected to be carried on over a four-year period. The four counties selected as sites for the study are Becker, Clay, Otter Tail and Wilkins.

Beginning in 1948, the Governor of Minnesota has appointed a Council on Children and Youth which has held a state-wide meeting in St. Paul or Minneapolis in every even-numbered year. The last meeting was in May, 1956. Members of the Child Health Committee have participated in these meetings, which have provided common meeting places for all organizations in Minnesota interested in children and youth. An advisory council composed of the chairman, vice chairman and consultants of each committee of the Council is continuing now as an active interim body. The chairman of the Child Health Committee is a member of this advisory council.

There is great need in our state for a Children's Diagnostic and Treatment Center for those children who have emotional and psychiatric diseases. In January, 1957, Judge Theodore B. Knudson, of Minneapolis, as a public-spirited citizen, called together representatives of about forty organizations interested in the establishment of a children's psychiatric hospital in Minnesota. The Minnesota State Medical Association was asked to send a representative. President J. Arnold Borgen appointed the chairman of the Child Health Committee to be this representative. A meeting with representatives of the state legislature and government was held at the Coffman Memorial Union at the University of Minnesota on February 16, 1957. Discussion concerned not only the psychiatric hospital but also a center for the outpatient care of children who have psychiatric problems and a screening center for the Youth Conservation Commission. The group recommended that the creation of a staff for the projected hospital be started, that further planning be done, that the legislature at the 1957 session provide for the acquisition of land and also some funds with which to start construction before 1959, if plans could be completed by then. The group was organized as a committee of nine, three of whom are physicians: Dr. Hyman S. Lippman of St. Paul, Dr. Reynold A. Jensen, of the University of Minnesota Medical School, and the chairman of the Child Health Committee. This group met on March 9, and subsequently, in person or by letter testified before a senatorial committee. In spite of the immediate need for these units, it is obvious that more planning is needed. Such planning is continuing. It is hoped that the nucleus for a staff for the new psychiatric hospital can be brought together by use of the presently available but grossly inadequate facilities at the Hastings State Hospital.

The Minnesota Department of Health for many years has published a series of cards bearing recommendations for the feeding of babies. Many physicians throughout the state have found these

cards useful. The cards must be periodically revised, however, and members of the Child Health Committee act in an advisory capacity in that duty.

Members of the Child Health Committee observe with great interest the follow-up study on neonatal deaths which has been carried on in Hennepin County for several years. Ultimately, it is hoped that this study can be enlarged to include the entire state.

Immunization against poliomyelitis and various other similar procedures have been cooperatively discussed with the Committee on Vaccination and Immunization. The chairman of the Child Health Committee, in addition to Dr. Raymond L. Page, of St. Charles, and Mr. Harold Brunn, represented the Minnesota State Medical Association in Chicago in January, 1957, at a national meeting called to deliberate the problem of immunization against poliomyelitis. Members of the Child Health Committee as well as those of the Committee on Vaccination and Immunization act in an advisory capacity to the Minnesota Department of Health for the publishing of the card of recommended practices for immunization procedures.

For many years the Parent-Teachers' Association has sponsored so-called summer roundups throughout the state. The roundups constituted an examination program carried out with the objective of assuring that all children would enter school in good health. The National Parent-Teachers' Association now has recommended, with the cooperative advice of many of the national medical organizations and other organizations interested in children, a program of health supervision which is more nearly adequate than simply examination of a child at the age of five years. Further information about this program will appear in *MINNESOTA MEDICINE*. An editorial on the subject already has appeared in the *Journal of the American Medical Association*. In the old summer round-ups, the Minnesota State Medical Association cooperated on a state level, and through many individual members on a local level. It is to be hoped that this cooperation will continue to be forthcoming in the new program. Dr. Eldon B. Berglund is the member of the Child Health Committee specifically working on this project.

The problems of children in Minnesota are many and varied. The Child Health Committee must be interested in all of them, and enlist the support and help of every member of the Minnesota State Medical Association. Cooperation among committees within the state medical association is most important and necessary. Similarly, cooperation with nonmedical or paramed-

(Continued on Page 883)

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

SPECIAL CHANNELS FOR PHYSICIANS' EMERGENCY USE URGED

Six radio channels for nationwide emergency use of physicians has been formally recommended to the Federal Communications Commission by the American Medical Association. Use of several channels for non-commercial FM educational broadcast stations was also recommended by the AMA.

Present availability of radio communication channels for the medical profession is very limited and that as a result, the value of this medium in the practice of medicine has not been fully realized, stressed the AMA.

Separate frequencies for hospitals and hospital associations was requested. More effective communication with ambulances and automobiles of staff physicians and surgeons, as well as for use in time of disaster were reasons cited.

U. S. WORKERS' HEALTH COVERAGE DRIVE RESUMED

Fact sheets with questions and answers and charts depicting advantages of the Administration-sponsored plan for prepaid medical care (including catastrophic coverage) and hospitalization will come out every two or three weeks up to return of Congress in January. Distribution by the Civil Service Commission will be to members of House and Senate committees on civil service, government personnel directors and employ unions.

PREPAID MEDICAL PLAN SUBSCRIBERS WANT ADDITIONAL BENEFITS

Michigan prepaid medical plan subscribers want more services and are willing to pay for them.

A public opinion survey conducted by the Michigan State Medical Society included results from an interview survey of 1,000 persons, a questionnaire mailed to more than 60,000 Michigan residents, a separate survey of doctor opinion and a compilation of facts from other surveys on this subject.

Results of the cross-section opinion study involv-

ing the views of more than 12,000 persons were reported.

The survey indicated the majority of the 81% of Michigan residents who are covered by some form of health insurance indicate they are satisfied with the situation. 64.6% have Blue Shield. Only 10% expressed unfavorable opinion of the service, 64% liked it, and 26% were noncommittal. The survey also showed that Blue Shield subscribers believe they pay an average of \$5.95 a month for medical and surgical coverage. The actual average is \$2.83. The majority are willing to pay up to \$6.95 a month in order to obtain additional benefits.

Diagnostic service in hospitals was the most requested added benefit. Many persons also expressed their desire to have Blue Shield include coverage for x-rays, emergency house calls, vaccinations, surgery in doctors' offices, and medical consultations.

Those in favor of such partial coverage voted for \$25 deductible per case rather than \$50 or \$100.

CONSCIOUSNESS OF COST ELIMINATES PATIENT-SURGEON MISUNDERSTANDING

A greater need for the medical profession to directly consider with the patient or his family the financial background of medical care was emphasized by Dr. William L. Estes, in his presidential address before the 43rd annual congress of the American College of Surgeons, in Atlantic City.

He explained that often the potential sources of surgeon-patient misunderstanding might be eliminated if patients were more fully informed regarding the total cost of medical procedure and the extent of benefits from insurance coverage.

A straightforward explanation of the hospital costs and surgical fees, preferably before the operation or at the earliest convenience in the case of an emergency, was the solution suggested by Dr. Estes.

ONE UNDERWRITER INSURANCE COVERAGE ADVISED FOR PHYSICIANS

Maintain your professional insurance under one underwriter is the advice given by Dr. Homer C. Pheasant in an article for the Bulletin of the Los Angeles County Medical Association. He suggests that physicians place their public liability and professional liability with a single insurance company, in order to avoid possible dispute in responsibility of coverage.

Dr. Pheasant cites the classic example of the patient who comes in to an ophthalmologist's office and receives drops in the eyes for the purpose of examination. Upon leaving the doctor's office, the patient stumbles due to a depression in the reception room floor. The premise liability insurance carrier rejects the claim, stating that it is one for the professional liability carrier due to the fact that the patient could not observe the depression as a result of the professional treatment received. In turn, the professional liability carrier alleged that the fall was a result of the depression in the floor and such fall was covered by the public liability carrier.

Dr. Pheasant further suggests the advisability of physicians engaged in group practice maintaining their total professional insurance coverage with a single insurance carrier, to also avoid confusion regarding responsibility.

FULL MEDICAL BENEFITS URGED BY AMERICAN LEGION

The American Legion has expressed increased opposition to the American Medical Association regarding the provision of medical and hospital benefits to veterans for non-service connected illness. The Legion adopted a resolution at its recent convention in Atlantic City reaffirming its support of Veterans Administration health services to non-service connected cases unable to afford private care. A comprehensive study of hospital beds and domiciliary facilities available to veterans suffering chronic diseases was also recommended by the Legion.

In his address to the convention, VA Administrator Harvey V. Higley criticized organized medicine for opposing hospitalization privileges to the non-service connected veteran. He went on to propose construction of an additional 3,300 mental and general medical and surgical beds, chiefly in Florida, Texas and California. At the

same time, he said, steps could be taken to close out 3,900 tuberculosis beds as a balancing measure.

NATIONAL HEALTH SURVEY COMMITTEE APPOINTED

A twenty-four member committee of physicians, educators, nurses, pharmaceutical executives, welfare leaders, public health officials, and insurance executives has been appointed to advise the Public Health Service on operations of the National Health Survey. The continuing project, established by the 1956 Congress was supported by the American Medical Association. However, the AMA cautioned that the operation must be so conducted as to insure general acceptance of its findings.

MEDICAL ASSOCIATIONS GET NEW TAX RULING

Action of Internal Revenue Service in reversing its own 1956 ruling dealing with group medical practice is highly significant. One of its results may be to smooth the road for passage of the Keogh-Jenkins pension plan. The chronology: In January, 1956, IRS ruled that doctors who form an association with the idea of obtaining corporate status benefits—including eligibility of member physicians to subscribe to tax-deferred pension plans—constitute a partnership and so they are disqualified for such plans, which are for *employees* and not employers or partners. This ruling went counter to the Federal court decision earlier (WRMS No. 450), which held that the association operating Western Montana Clinic fulfilled criteria of a corporation, for tax and pension plan purposes.

For nearly two years, tax headquarters in Washington was in the painful position of having to explain over and over again why the doctors in the Montana group could utilize Sec. 401 (a) of Internal Revenue Code—because court said so—while other medical groups administered in identical manner could *not* do so—because IRS said so. Now IRS is “modifying its position,” to use its own words.

New policy: Fact that a medical group sets up a pension plan under 401 (a) will *not* be determinative in categorizing the organization as a partnership or anything else. Rather, the usual tests will be applied to ascertain whether group

has more of the criteria of a corporation than a partnership. Basic criteria, which will hinge on the group's pattern of organization and administration, to be used in making final determination will be published at a later date.

TREATMENT OF MILITARY PERSONNEL OF THE ARMY

Colonel George E. Leone, Army Surgeon, Headquarters Fifth Army Medical Corps, offers the following information to facilitate prompt payment of vouchers for medical care provided Active Army personnel by civilian physicians and hospitals:

Military personnel of the Army who are on authorized absence, should have in their possession Department of Army Form No. 31, "Request and Authority for Absence." The reverse side of this form contains instructions pertaining to medical treatment or hospitalization that may be required while a military person is absent from his home station. Failure to follow these instructions sometimes results in delay in processing bills for care provided by civilian physicians and hospitals. Physicians and hospitals who treat military personnel are urged to assist them in notifying the proper military authorities. The processing and payment of bills for the care of military personnel should not be confused with the medicare program for dependents.

WALTER P. REUTHER GIVES LABOR'S PREPAYMENT GOALS

The following are excerpts from the text of the 1957 Biddle Lecture before the Annual Convention of the Michigan State Medical Society prepared for delivery by Walter P. Reuther, UAW president and read by Leonard Woodcock, UAW vice president.

"The president of the American Medical Association recently deplored labor demands for full payment of all items in medical care. He accused labor, by setting this improperly high standard, of disparaging the performance of existing plans. This charge doesn't even come close to the real issue. We are not, as Dr. Allman seems to think, arguing about extending insurance from covering most of the cost of health to covering all of it. Present insurance plans, at best, cover only one-third of the average family's

health service bill, and we are trying to get benefits extended to cover about another third of health needs.

Workers not only want more and better prepaid health coverage, but they are willing to pay for it. . . . The fact that employers pay premiums in full or in part has led to the false assumption that workers will make unreasonable demands for health coverage because, somehow, they are not paying for it. They are, because employer contributions are monies the worker could otherwise get in cash or other benefits.

Doctors have made great gains out of the fact that the workers have earmarked a portion of their wages as social wages. This has permitted a greater economic allocation to the cost of hospital and medical care, if only by the fact that in this collective way, workers as a whole, have been able to pay for medical care that they could not have paid for on an individual basis. The trouble is that this has led some doctors to assume that the insurance has increased the worker's ability to pay, and they charge more for their services. As a result, we have found that the dollar paid by the employer and the worker under the health plan is not worth as much as the dollar paid out of pocket at the time the service is performed. . . .

Medical societies entered prepayment to avert legislation. They were relatively less concerned with finding the best possible way of prepaying medical care. Rather than to hammer out a whole new set of insurance principles that could be properly applied to medical care, they adapted the ready made doctrines of casualty insurance. . . .

I really don't believe that the average doctor, with his deep interest in medical services, is ready to adopt the insurance industry's concepts of losses rather than benefits, indemnity rather than service, financial devices to inhibit use, to eliminate the small claim and to exclude predictable expenses rather than preventive care, early diagnosis and easy access to health service. . . .

The UAW decided not to launch a separate union medical care program. It has taken the much more difficult course of working with the rest of the community. . . .

We will support experimentation which is soundly conceived and medically oriented and which effectively removes the economic barriers to medical care."

PRELUDE TO PUBLIC RELATIONS

Development of a doctor-hospital-press code for the handling of medical news was the subject of a panel discussion held recently in conjunction with the fall meeting of the Minnesota Associated Press newspapers in Crookston, Minnesota. The Minnesota State Medical Association participated on invitation of the AP, and Dr. C. L. Oppengaard of Crookston, Chairman of our Council, and Mr. John L. Bach of Chicago, Director of Press Relations for the American Medical Association, represented medicine on the panel.

Mr. Paul Swenson, managing editor of the *Minneapolis Star* and chairman of the AP hospital-doctor-press code, was directed to confer with state representatives of the other two groups. After agreement at the state level on the desirability of such a code, local newspapers and hospital and physician groups were urged to work out codes locally.

Similar conferences under county medical society sponsorship have been suggested for other areas of the state.

Recent revision in the American Medical Association code of ethics gives doctors more freedom than they once had in their relations with news media. Use of this latitude in promotion of these three-way conferences will not only produce a better understanding as to handling of medical news but will certainly advance public good will generally.

Hennepin County Medical Society and the Red River Valley Medical Society have already adopted such codes.

The following editorial regarding the medical profession and its relationships to news media appeared recently in the *Detroit Medical News*. Dr. Milton R. Weed is the author.

"Some physicians bitterly critical of medical news reporting refuse to talk to reporters. They accuse newspapermen of sensationalism, inaccuracy, lack of perspective, and even purposeful distortion of news. Almost all doctors dread having their names appear in newsprint for, if an article is favorable, they may be accused of self-laudation, and if it is not, they are likely to be condemned for undermining the public's confidence in the profession.

"Every science writer knows, however, that to write with authority he must cite his references as accurately as a scientist documents his premises. And his problem is complicated by news competition and deadlines. This situation creates misunderstanding and recrimination.

"Actually newspapermen and doctors have much in common.

"Both are usually motivated by public interest. The majority of editors are men of discernment, high ideals and public spirit and this attitude is transmitted in greater or lesser degree to their staffs. The doctor, bound by oath and the ethical code to protect his

patient, the best interests of the public and the honor of his profession, may forget that reporters are responsible people too: they do not deliberately embarrass their sources of information—they may want to use them again—, or make fools of their paper or its readers, but they are determined to provide the public with legitimate news and any attempt at suppression arouses suspicion of skullduggery.

"Physicians and newspapermen also agree that the public is entitled to medical news fairly and accurately presented. Medicine, in self interest, needs good science reporting to interpret its discoveries, health information and viewpoints to the public which supports it.

"Obviously, better medical news reporting cannot be realized if scientists refuse to talk to newspapermen. Nor can it be achieved by cutting off any authoritative source of information, or by declining to give the facts, background, or perspective—ethical and scientific—needed for good reporting. . . .

"Can more be done? Should not all physicians feel free to talk to reporters? Most reporters we have encountered are sympathetic to patients' rights and the public's interest when they understand how these are involved. From doctors seeking self laudatory publicity we have little to fear. Reporters conditioned by press releases and innumerable interviews with ax-grinding publicity-seekers can spot a phony faster than a pediatrician can recognize chicken pox.

"It seems to us that all physicians ought by every means available to cultivate intelligent understanding and honest co-operation with newspapermen in the interest of accurate medical news. Maybe we are naive; maybe it just happens that the reporters we know are exceptional guys—none writes for *Confidential*."

COMMITTEE ACTION

(Continued from Page 879)

ical groups interested in problems of children also is essential and can be very rewarding.

Finally, I would pay tribute to the members of the Child Health Committee who have served with me these past 11 years: Drs. R. O. Bergan, Eldon B. Berglund, Tague C. Chisholm, George Erickson, John J. Galligan, O. H. Jones, A. B. Rosenfield, Viktor O. Wilson, Charles W. Rogers, Edward Zupanc, William B. Richards, Stuart L. Arey, Frank G. Hedenstrom, Roland E. Nutting, Lawrence F. Richdorf, Raymond J. Josewski, Roger L. J. Kennedy, Irvine McQuarrie, Oswald S. Wyatt, Edward E. Novak, C. H. Schroder, Erling S. Platou, and Lyman R. Critchfield. No chairman could wish for a more willing and able group of men.

GEORGE B. LOGAN, M.D.,
Chairman

Meetings and Announcements

STATE

MINNESOTA STATE MEDICAL ASSOCIATION, 105th annual meeting, Minneapolis, May 22, 23 and 24, 1958. Business sessions and exhibits, Minneapolis Auditorium. Headquarters, Leamington Hotel.

NATIONAL

American College of Surgeons, sectional meeting, Des Moines, Iowa, March 27-29, 1958.

American College of Chest Physicians. Warwick Hotel, Philadelphia, Pennsylvania, December 2-3, 1957.

American Gastroenterological Association, 59th annual meeting, Washington, D. C., May 30-31, 1958. H. M. Pollard, M.D., Secretary-General, University Hospital, Ann Arbor, Michigan.

Cardiac Symposium sponsored by the American Heart Association. Valley Ho Hotel Scottsdale, Arizona, January 31-February 1, 1958.

Mediclinics of Minnesota. Fort Lauderdale, Florida, March 2-12, 1958.

Second Illinois Congress on Maternal and Infant Care. Hotel Pere Marquette, Peoria, Illinois, February 4-6, 1958.

INTERNATIONAL

Fifth International Congress on Diseases of the Chest, sponsored by American College of Chest Physicians, Tokyo, Japan, September 7-11, 1958.

Fifth International Congress of Internal Medicine, Philadelphia, Pennsylvania, April 24-26, 1958. Edward R. Loveland, Secretary-General, 4200 Pine Street, Philadelphia 4, Pennsylvania.

International Society of Internal Medicine, Fifth International Congress of Internal Medicine, Philadelphia, Pennsylvania, April 24-26, 1958. Edward R. Loveland, Secretary-General, 4200 Pine Street, Philadelphia 4, Pennsylvania.

World Congress of Gastroenterology, Washington, D. C., May 25-31, 1958. H. M. Pollard, M.D., Secretary-General, University Hospital, Ann Arbor, Michigan.

CONTINUATION COURSES

Medical continuation courses to be presented at the Center for Continuation Study, University of Minnesota, are as follows:

December 5-7	Fractures for General Physicians
January 6-11	Ophthalmology for Specialists
January 9-11	The Newer Drugs in General Practice
Jan. 30-Feb. 1	Emergency Surgery for General Physicians
February 6-8	Cardiovascular Diseases for General Physicians
February 10-15	Neurology for General Physicians and Specialists

For further information concerning the above courses, write to the Director, Department of Continuation Medical Education, 1342 Mayo Memorial, University of Minnesota, Minneapolis 14.

NURSING LICENSE RENEWAL FOR 1958

Currently licensed Minnesota registered nurses and licensed practical nurses who intend to practice in Minnesota next year are reminded to renew their licenses prior to January 1, 1958. The 1958 renewal fee of \$1.00 (money order preferred) is to be sent to the Minnesota Board of Nursing, 700 Minnesota Building, St. Paul 1, Minnesota. A late penalty fee of \$1.00 will be charged for renewals postmarked after December 31, 1957.

Requests for placement in the non-practicing status may be made instead of renewal of license by those currently-licensed nurses who do not intend to practice in Minnesota at any time in 1958.

CHICAGO OPHTHALMOLOGICAL SOCIETY

The Chicago Ophthalmological Society will hold its annual clinical conference on February 21 and 22, 1958, at the Drake Hotel in Chicago, Illinois.

The guest speakers will include Dr. Wendell L. Hughes, Hempstead, N. Y.; Dr. P. Robb McDonald, Philadelphia, Pa.; Dr. Phillips Thygeson, San Jose, California; Dr. Lorenz E. Zimmerman, Washington, D. C.; Dr. Eugene R. Folk, Chicago, Illinois; Dr. Orville E. Gordon, Chicago, Illinois; Dr. William F. Hughes, Chicago, Illinois; Dr. Peter C. Kronfeld, Chicago, Illinois; Dr. David Shoch, Chicago, Illinois; Dr. Derrick Vail, Chicago, Illinois, and Dr. Howard L. Wilder, Chicago, Illinois.

The subjects will include a symposium on the complications of ophthalmic surgery, the zonule of the lens, glaucoma and retinal detachment surgery, plastic surgery techniques, management of glaucoma and cataract, melanotic tumors of the iris, and the structure of the vitreous.

Registration fee for the entire course including round table luncheons and buffet supper is \$45.00 and may be payable to the Registrar: Mrs. Edward J. Ryan, 1150 North Lorel Avenue, Chicago 51, Illinois.

The Fourteenth Annual Samford R. Gifford Memorial Lecture will be delivered by Dr. Phillips Thygeson of San Jose, California, on Friday, February 21, 1958, at the Drake Hotel at 5:15 p.m. All ophthalmologists are invited to attend the Gifford Memorial Lecture and the buffet supper which follows.

RED RIVER VALLEY MEDICAL SOCIETY AND AUXILIARY MEET

The Red River Valley Medical Society and Auxiliary held their annual fall dinner meeting at the Rex Cafe, Thief River Falls, in October.

Dr. W. E. Anderson of Clearbrook, president of the Society, conducted the program, which included a paper on surgical treatment of coronary heart disease given by Dr. Nathan K. Jensen of Minneapolis.

Members of the Auxiliary met at the home of Mrs. Wm. Feigal.

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In Memoriam

JOHN LEO DELMORE, SR.

Dr. John Leo Delmore, Sr., Roseau physician and surgeon, died November 7, 1957, at his home. He was seventy years old. He had served as physician and surgeon in the Roseau area since 1909.

In 1949, Dr. Delmore was publicly honored for forty years of service to his community. He was also honored in 1954 by the Minnesota State Medical Association with the presentation of a gold-inscribed associate membership plate in recognition of his forty years of service in the medical profession.

Dr. Delmore was born in 1886 in Elroy, Wisconsin, and received his preliminary education in the Marshfield, Wisconsin, schools. He was a graduate of the University of Minnesota School of Medicine, class of 1909. He interned at St. Joseph's Hospital in St. Paul.

Positions and professional affiliations held by Dr. Delmore included: Superintendent and Chief of Staff at Budd Hospital, Roseau, Phi Beta Pi Medical Fraternity, Red River Valley Medical Society, Minnesota State Medical Association, and American Medical Association.

He is survived by his wife; four sons—Dr. John, Roseau, Dr. Robert, New Orleans, La., Michael, Manitowoc, Wis., and James P., Rochester; three daughters—Mrs. Louise LaBonte, Roseau, Mrs. D. L. Bray, Algona, Iowa, and Sister St. Jean, Grand Forks, North Dakota.

JAMES N. DUNN

Dr. James N. Dunn, St. Paul physician, died at his home November 15, 1957, at the age of sixty-six.

He was former chief of staff at St. Joseph's Hospital, St. Paul. At the time of his death, he was on the staff of Ancker and St. Joseph's hospitals and on the courtesy staff of St. Luke's Children's and Miller hospitals.

Dr. Dunn was a past president of the Ramsey County Medical Society. He was an active member of the Minnesota State Medical Association, the American Medical Association, and the American College of Physicians. He was a former member of the Ramsey County Welfare Board and, during World War II, he served on the advisory board for draftee examinations and on the state board for procurement of medical officers.

Dr. Dunn was born in Alexandria, South Dakota, and received his preliminary education at North High School in Minneapolis. He was a graduate of the University of Minnesota School of Medicine, class of 1916. Special work included one year of internship at St. Paul Ancker Hospital and one year at Base Hospital 64, Fort Riley, Kansas. In 1932, he did postgraduate work at St. Bartholomew's Hospital in London, England.

Survivors include his wife, Pearle; a son, James M., Ames, Iowa; four daughters, Mrs. Donal Barrer, Bethesda, Maryland; Mrs. Keith Kuehn, Kenosha, Wisconsin; Mrs. Vincent Erickson, North Hollywood, California; and Mrs. Glabe Staffin, St. Paul; two sisters, Mrs. George Frey, Luverne, and Mrs. Marshall Osborne, Inglewood, California; and eleven grandchildren.

EDWARD QUIRIN ETEL

Dr. Edward Quirin Ertel, Ellendale, Minnesota physician for more than forty-eight years, died in an Albert Lea hospital, October 29, 1957, at the age of 76.

He began his practice in the Ellendale community, September 23, 1908, and for many years was that community's only physician.

Dr. Ertel was a graduate of the Medical College of Iowa, class of 1907.

He served as a member of the Ellendale school board for thirty-six years. In 1956, Dr. and Mrs. Ertel donated a five-acre tract of ground to the school system of that community to be used as an athletic field. In addition, Dr. Ertel had also served on the Ellendale village council, had been an Ellendale health officer, and was a member of the Steele County health board.

He was a member of the Minnesota State Medical Association and former president of the Steele County Medical Society.

Dr. Ertel is survived by his widow. The couple had no children.

CHARLES E. PROSHEK

Dr. Charles E. Proshek, formerly honorary Czechoslovakian consul in Minneapolis, died October 30, 1957, at his summer home. He was sixty-four.

Dr. Proshek, native of New Prague, Minnesota, received his degree from the University of Minnesota Medical School in 1917.

For more than thirty-five years, Dr. Proshek practiced medicine in Minneapolis. He was a staff member of Swedish Hospital and a member of Hennepin County Medical Society, Minnesota State Medical Association, and the American Medical Association.

After World War I, Dr. Proshek worked in Europe with the Red Cross in settling displaced persons. Following World War II, he served in a similar capacity with the United Nations Relief and Rehabilitation Association. The assignment included a one-year term with the United States Public Health Service in Munich, Germany. Dr. Proshek resigned from his consular post in 1948 after twenty years of service.

Survivors include his wife, Gabriela; a son, Dr. Lumir C. Proshek, Edina; three brothers, Frank and George, New Prague, and Theodore, Colorado Springs, Colorado; three sisters, Mrs. Jenny Vanasek, New Prague, Mrs. Antoinette Machacek, Northfield, and Mrs. Barbara Benjamin, Washington, and a grandson.

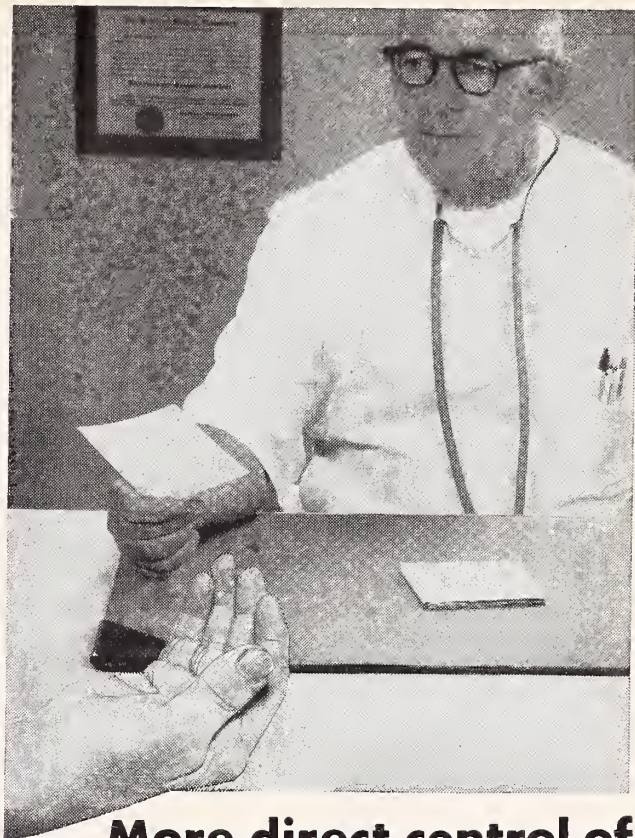
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* * *

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Woman's Auxiliary

GOODHUE COUNTY AUXILIARY HOLDS MEETING

The Goodhue County Medical Auxiliary held its October meeting at the St. James Hotel, Red Wing. Following luncheon, a business meeting was held, presided over by Mrs. Ezra Bridge of Mineral Springs Sanatorium, Cannon Falls. It was with deep regret that the resignation of Mrs. Bridge was accepted. Dr. and Mrs. Bridge are leaving shortly to make their home in Port Huron, Michigan, where Dr. Bridge will enter private practice.

"Health is a Joint Endeavor" is the theme for the ensuing year, not only on a county level, but throughout the nation.

Following the meeting, the group proceeded to the Washington School, where they observed the work being done with exceptional children. This project is one of several in which the auxiliary is vitally interested and lends its support.

RAMSEY COUNTY AUXILIARY NEWS

Board members of the Women's Auxiliary to the Ramsey County Medical Society met in the medical library on November 11. Mrs. Herman Wolff, president, presided and members made cancer dressings during and following the meeting.

Mrs. Ralph L. Olsen attended a Traffic Conference, and Mmes. Leroy Fox, Walter Gardner, and Herman Wolff attended a Tuberculosis Christmas Seal dinner on October 28, as Auxiliary representatives. Reports on the meetings were given.

The Auxiliary has agreed to collect medical magazines for the Bruce Publishing Company, who will send them to foreign countries. The magazines will be made available to interested people in other countries.

Members of women's clubs in St. Paul are competing in a table decorating contest at the Golden Rule. Mrs. Albert Hayes will represent the Ramsey County Auxiliary.

The monthly luncheon meeting was held on November 18 in the University Club. Mrs. John Meade and Mrs. Burtis Mears, program chairmen, presented Mr. Warren T. Mosman, art consultant for Ellerbe and Company, who spoke on the very interesting topic, "Art in Professional Buildings."

RANGE AUXILIARY DISCUSSES YEAR'S PROGRAM

The Range Medical Society Auxiliary held its October meeting in the Androy Hotel, Hibbing. Dinner was

enjoyed with members of the Range Medical Society. A short business meeting followed.

Mrs. Richard Barnes of Aurora, auxiliary president, reported on the instructional program she had attended two weeks previously in Minneapolis.

The auxiliary program for the coming year will stress safety, mental health, the American Medical Education Foundation, and *Today's Health* magazine.

The next auxiliary meeting will be held in Virginia at Hotel Coates.

MRS. C. L. OPPEGAARD ADDRESSES ZUMBRO VALLEY AUXILIARY

Mrs. C. L. Oppegaard, Crookston, state auxiliary president, was guest speaker at the November 13 luncheon meeting of the Zumbro Valley Medical Auxiliary, held at the Rochester Country Club. Other state officers present were Mrs. William Gjerde, Lake City, state mental health chairman, and Mrs. W. O. Finkelnburg, Winona, state cancer chairman. Also present were members from Austin, Winona, Lake City, Cannon Falls and Spring Valley.

Mrs. Howard Polley, Region One advisor, presided at the meeting and introduced Mrs. Oppegaard. The latter outlined the four main objectives of the auxiliary for the coming year. They are: (1) promotion of the American Medical Education Foundation or fund, (2) promotion of subscriptions to "Today's Health," a magazine for lay people, (3) the safety project, which includes sponsoring of drivers' education for high school students, (4) increased interest in legislation as it affects medical practice.

Mrs. W. E. Wellman, president of the Zumbro Valley Auxiliary and former state AMEF chairman, emphasized the importance of doctors and their wives continuing their support of the AMEF as a means of giving financial aid to medical students.

Mrs. Gjerde requested more volunteer help in all the state mental health hospitals.



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CAPSULES

General Interest

Dr. Gordon M. Martin, consultant in the section of physical medicine and rehabilitation at the Mayo Clinic, was among fifteen alumni of Nebraska Wesleyan University who were recently cited at an honor convocation of that institution in Lincoln, Nebraska.

* * *

Dr. Clair C. Craig, International Falls physician, was recently honored on the occasion of his eighty-first birthday.

* * *

Big Stone county recently received tuberculosis accreditation rating for its progress in reducing TB death and infection rates. Speaker at the five county Christmas seal meeting was **Dr. Willard Peterson**, Willmar, president of the Kandiyohi County Tuberculosis and Health Association. Dr. Peterson is also a member of the Minnesota State Medical Association's Committee on Tuberculosis.

* * *

Four hundred volunteer Christmas Seal workers from all parts of Minnesota recently heard addresses by **Dr. Mario Fischer**, Duluth, president-elect of the National Tuberculosis Association, and **Dr. J. A. Myers**, Minneapolis, specialist in diseases of the chest. The addresses were given in conjunction with the annual Christmas Seal dinner, at Coffman Memorial Union, University of Minnesota.

* * *

Dr. Galen Adkins, Cambridge, has been named superintendent of the Sandstone State Hospital. He succeeds **Dr. Kenneth W. Douglas**, who has accepted the superintendency of the Mt. Pleasant Home and Training School in Michigan.

* * *

Dr. Frank H. Krusen, president of the Minnesota State Board of Health and medical head of the department of Physical Medicine and Rehabilitation at the Mayo Clinic, has been cited by Governor Freeman for his service as chairman of the Governor's advisory committee on Vocational Rehabilitation.

* * *

Three doctors were elected to the Minnesota Medical Foundation's board of directors at the group's meeting in Minneapolis. **Dr. Charles E. Rea** and **Dr. Arnold Lazarow**, both of St. Paul, and **Dr. Ragnvald S. Ylvisaker**, of Minneapolis, were elected to four-year terms.

* * *

Dr. William A. Chervenak has started a practice in Winsted and Silver Lake in association with **Dr. J. J. Carroll**. Dr. Chervenak is a graduate of George Washington University, class of 1955. He was previously associated with a Long Prairie clinic.

* * *

Three Minnesotans have been named to national leadership posts in the American Heart Association. **Dr. Edgar V. Allen**, senior consultant in peripheral vascular

diseases at the Mayo Clinic, Rochester, and out-going national president, has been named to a three-year term on the board. **Dr. John W. Kirklin**, Mayo Clinic heart surgeon, and **Mrs. Myrtle Coe**, nursing professor at the University of Minnesota, were elected to the national assembly. Dr. Allen was also awarded the group's distinguished service medallion for his work in the nation's attack upon diseases of the heart and blood vessels.

* * *

Dr. Einar C. Andreassen, veterans administration area medical director at Fort Snelling has announced his retirement, effective at the end of November.

* * *

Dr. Victor Johnson, director of the Mayo Foundation, will be a deputy president and chairman of the program committee of the second World Conference on Medical Education to be held August 30 to September 4, 1959, in Chicago.

* * *

The cornerstone laying ceremonies for a million dollar cancer hospital were recently conducted by the Minnesota Grand Lodge of Masons at the University of Minnesota. The Masonic Memorial Hospital, located at Harvard and Essex Streets, is dedicated to the treatment of terminal cancer.

* * *

Dr. Orris Rollie, St. Paul, has been appointed Ramsey County health officer. He succeeds **Dr. A. M. Lundholm**.

* * *

Dr. E. H. Ryncarson, chairman of the Sections of Endocrinology and Metabolism at the Mayo Clinic, presented a paper on "Obesity" at the recent three-day program of the Academy of Psychosomatic Medicine held in Chicago.

* * *

Dr. Ralph K. Ghormley, head of the Section of Orthopedic Surgery in the Mayo Clinic from 1947 to 1955 and professor of Orthopedic Surgery in the Mayo Foundation, was recently honored by former fellows in orthopedic surgery and colleagues who contributed toward the establishment of a traveling education scholarship, named in his honor. The scholarship will be awarded to fellows in orthopedic surgery in the Mayo Foundation, to enable them to visit leading centers in orthopedic surgery in this country and abroad. Dr. Ghormley is now a senior consultant in this section.

* * *

Dr. William F. Braasch, head of the Section of Urology at the Mayo Clinic from 1914 to 1939, was recently honored by fellows of the Mayo Foundation, members of the staff of the Mayo Clinic, and friends of Dr. Braasch. He was presented with a portrait painted by E. V. Brewer of St. Paul.

* * *

Dr. R. A. MacDonald has resigned as resident physician of the Littlefork Municipal Hospital.

(Continued on Page A-54)

ANNOUNCING
The Twenty-First Annual Meeting
of
The New Orleans Graduate Medical Assembly
Conference Headquarters — Roosevelt Hotel
March 3, 4, 5, 6, 1958

GUEST SPEAKERS

Carleton B. Chapman, M.D., Dallas, Tex.

Cardiology

Herbert Rattner, M.D., Chicago, Ill.

Dermatology

Charles A. Flood, M.D., New York, N. Y.

Gastroenterology

Robert A. Davison, M.D., Memphis, Tenn.

General Practice

Lawrence M. Randall, M.D., Rochester, Minn.

Gynecology

Bayard T. Horton, M.D., Rochester, Minn.

Internal Medicine

Perrin H. Long, M.D., Brooklyn, N. Y.

Internal Medicine

George N. Raines, Capt., MC, USN, Washington, D. C.

Neuropsychiatry

Robert H. Barter, M.D., Washington, D. C.

Obstetrics

Ralph O. Rychener, M.D., Memphis, Tenn.

Ophthalmology

C. Leslie Mitchell, M.D., Detroit, Mich.

Orthopedic Surgery

Frank D. Lathrop, M.D., Boston, Mass.

Otolaryngology

Arthur H. Wells, M.D., Duluth, Minn.

Pathology

James Marvin Baty, M.D., Boston, Mass.

Pediatrics

Harold O. Peterson, M.D., Minneapolis, Minn.

Radiology

Jere W. Lord, Jr., M.D., New York, N. Y.

Surgery

Claude E. Welch, M.D., Boston, Mass.

Surgery

Ormond S. Culp, M.D., Rochester, Minn.

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A memorial fund in memory of Dr. N. M. Leitch, former Warroad physician, has been established to provide additional equipment for that community's hospital. Dr. Leitch practiced in the Warroad community for twenty years prior to his death.

* * *

Newly elected officers of the Minnesota Society of Internal Medicine include: Dr. R. S. Ylvisaker, Minneapolis, president; Dr. Wendell H. Hall, Minneapolis, secretary-treasurer; and Dr. R. L. Parker, Rochester, vice president.

* * *

Dr. Fred W. Wittich, Minneapolis, was guest speaker at the Eleventh Annual Postgraduate Clinic of the Michigan Chapter and Wayne County Chapter of the Michigan Academy of General Practice, held in Detroit, Michigan, November 6 and 7. He presented a paper on headaches of vascular origin and showed a scientific exhibit on the same subject.

* * *

Dr. Dickinson W. Richards, Lambert professor of medicine, Columbia University, delivered the Leo G. Rigler lecture at the recent continuation course in cardiovascular radiology at the University of Minnesota, speaking on "Bullous Emphysema." Dr. Rigler, formerly on the University of Minnesota medical school faculty and now visiting professor, department of radiology, University of California School of Medicine at Los Angeles, was on the course faculty.

* * *

Dr. Frank Morrell discussed "The Effect of Focal Epileptogenic Lesions on Conditioned Electrical Responses in Brain," at the recent meeting of the Minnesota Society of Neurology and Psychiatry in St. Paul. Drs. Burtrum C. Schiele and Wilbur Benson discussed "A Proposed Classification of Tranquilizing Drugs."

* * *

Dr. Bernard B. Raginsky of Montreal, Quebec, was elected president of the Academy of Psychosomatic Medicine at their recent 4th annual meeting in Chicago. Other officers elected were: Dr. Lester L. Coleman, New York, vice president; Dr. Wilfred Dorfman, Brooklyn, secretary; Dr. George F. Sutherland, Baltimore, treasurer; Dr. Maury Sanger, Brooklyn, historian, and Dr. William S. Kroger, Chicago, president-elect.

* * *

Drs. J. W. Dushane, L. E. Harris, J. W. Kirklin, G. B. Logan and S. D. Mills, of the Mayo Clinic and Foundation, attended the recent meeting of the American Academy of Pediatrics at Chicago.

* * *

Dr. Henry V. Hanson, recently retired from the University of Minnesota Medical School staff where he was professor of otolaryngology, and from the Veterans Hospital where he was Chief of Ear, Nose and Throat, and Mrs. Hanson just returned from a two months' tour of Europe.

* * *

Dr. Donald C. Balfour, emeritus director of the Mayo Foundation and former head of a section of surgery in

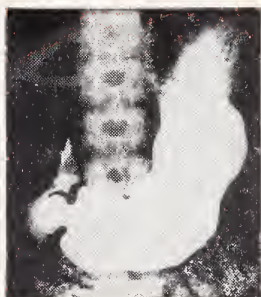
(Continued on Page A-56)

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(Continued from Page A-54)

the Mayo Clinic, was recently awarded a hand-illuminated certificate designating him an honorary life member of the Medical Alumni Association of the University of Toronto.

* * *

Dr. Ulf Rudhe, acting chief of the diagnostic roentgenology department of the Caroline Hospital in Stockholm, Sweden, lectured at the Mayo Foundation House recently on "Some Problems in Cardioroentgenology."

* * *

Dr. Hallowell Davis, professor of physiology in the Washington University School of Medicine, St. Louis, and president-elect of the American Physiological Society, lectured at the Mayo Foundation recently on "Nature's Electroacoustic Engineering in the Ear." Another recent lecturer at the Mayo Foundation was **Dr. Walter G. Maddock**, professor of surgery in the Northwestern University Medical School, Chicago.

* * *

Dr. Gaylord Anderson of the University of Minnesota School of Medicine staff, moderated a discussion on the worldwide threat of tuberculosis recently. Participants in the discussion were three doctors from India: **Drs. K. P. Mankani** and **V. H. Thakor** of Bombay, and **S. S. Bharara** of New Delhi.

* * *

Dr. Charles Sheard, professor and director emeritus of the division of physics and biophysical research of the Mayo Clinic and Mayo Foundation, recently re-

ceived the Edgar D. Tillyer Medal for 1957 in recognition of his writings and research in physiological optics from the Optical Society of America in Columbus, Ohio.

* * *

Dr. Kenneth N. Ogle, of the Mayo Clinic staff in the section of biophysics and biophysical research, received the Beverly Myers Nelson Achievement Award of the Educational Foundation in Ophthalmic Optics.

* * *

Dr. Waltman Walters, head of a section of general surgery in the Mayo Clinic and professor of surgery in the Mayo Foundation, delivered the 10th annual Julius Friedenwald Memorial Lecture at the University of Maryland Medical School in Baltimore recently.

* * *

Dr. C. Allen Good, of the Mayo Clinic's department of radiology, was elected secretary of the American Roentgen Ray Society at the group's annual meeting in Washington, D. C., recently.

* * *

Dr. Arthur B. Hunt, head of a section of obstetrics and gynecology in the Mayo Clinic and professor of obstetrics and gynecology in the Mayo Foundation, delivered the presidential address at the recent annual meeting of the Central Association of Obstetricians and Gynecologists in Omaha, speaking on "Every Man's Legacy."

* * *

Dr. Charles W. Mayo spoke on the United Nations at a convocation at Carleton College in Northfield recently.

* * *

Dr. Hamilton Montgomery, member of the section of dermatology of the Mayo Clinic and professor of dermatology and syphilology in the Mayo Foundation, and **Dr. Louis A. Brunsting**, head of the section of dermatology in the Clinic, were made honorary foreign members of the British Association of Dermatology at their recent annual meeting in London.

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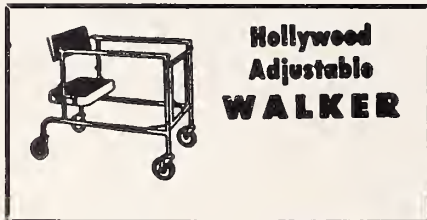
Mac F. Cahal, executive secretary of the Minnesota section of the American Academy of General Practice, addressed Minnesota general practitioners at their recent two-day meeting in Minneapolis. **Dr. N. K. Jensen**, Minneapolis, talked on "Early Management of Crushed Chest" at the meetings. Other talks included: **Dr. Reinold Jensen**, University of Minnesota on "The Mentally Retarded Child," **Dr. Charles Blake**, Minneapolis on "Diagnosis of Spinal Cord Tumors," **Dr. Henry Moehring**, Duluth on "X-Ray Aids in Obstetrics," and **Dr. Clark Millikan**, Mayo Clinic on "Care of Various Types of Strokes."

* * *

Dr. A. C. Aufderheide, Duluth, recently received certification as a member of the Board of the American Society of Clinical Pathologists in New Orleans.

* * *

A Mayo Foundation fellow in surgery, **Dr. Martin Y. Laberge** of Quebec, Canada, is one of the recipients of the Edward John Noble Foundation of New York City grants.



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GENERAL INTEREST

Dr. Joseph Callan, Virginia, attended the recent meeting on peripheral vascular diseases in Rochester.

* * *

Dr. F. M. Jolin, of the Grand Rapids Clinic, retired from active medical practice recently.

* * *

Dr. Malcolm Fifield, Duluth, presented a paper on the diagnosis and treatment of urethral and bladder injuries at the recent meeting of the Duluth Surgical Society.

* * *

Mrs. Dorothy C. Girvin, wife of Dr. Richard B. Girvin, Minneapolis physician, died October 30, 1957.

* * *

Dr. C. O. Kohlbray, Duluth, has been elected president of the Northwest Pediatric Society.

* * *

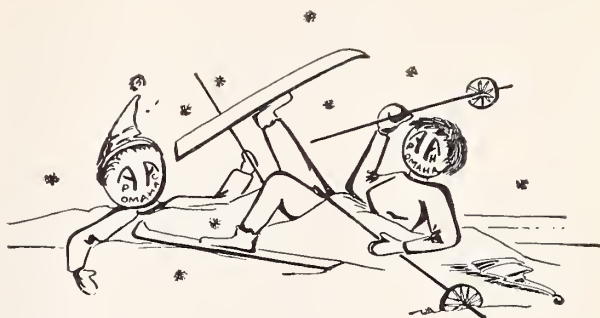
Dr. Richard Granquist has left his private practice in Coleraine and has begun an orthopedic residency at the University of Minnesota.

* * *

Dr. S. Shirai, formerly of Coleraine, Minnesota, was discharged from the Army in July and has entered practice in Evergreen, Colorado.

* * *

Dr. Winchell McK. Craig, emeritus head of the Section of Neurologic Surgery of the Mayo Clinic, spoke on "Quo Vidis," as part of his participation in the 64th annual meeting of the Association of Military Surgeons of the United States in Washington, D. C., recently.



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MINNESOTA BLUE SHIELD-BLUE CROSS

Minnesota Blue Shield has provided benefits for the delivery of over 111,615 new Minnesotans. This is the number of obstetrical claims paid by Blue Shield from the date the plan began operations through August, 1957.

Obstetrical benefits provided by Blue Shield as of August 31, 1957, total over \$6,494,000. This figure is equal to an average Blue Shield obstetrical allowance of approximately \$58, because from the plan's beginning through the year 1953, the maximum obstetrical benefit under Plan A contracts was \$50. However, the maximum Plan A obstetrical benefit was increased to \$60 on January 1, 1954, and at the same time the waiting period for obstetrical benefits was reduced from ten to nine months. Moreover, on March 1, 1954, the Plan B contract, which has obstetrical benefits of \$100 was offered to the public.

During the first eight months of 1957, Blue Shield provided benefits for 14,121 obstetrical deliveries, a monthly average of more than 1,765. The amount paid by Blue Shield for obstetrical services during this eight-month period was \$927,969, an average obstetrical benefit of over \$65. The amount in excess of \$60 is attributable primarily to obstetrical benefits provided under Plan B contracts.

Blue Cross payments totaling \$20,916,957.18 have been provided for 151,325 Minnesotans during the first nine months of 1957. These totals reflect 908,294.2 days of hospital care.

The incidence rate of hospitalization represented by this experience was 482 cases paid per year per 1,000 contracts protected, an increase of 5.5 per cent compared with the hospitalization experience during the same period of 1956.

The leading cause for hospitalization of Minnesota Blue Cross subscribers during the first nine months of 1957 was accidental injury. Accidental injury was also the leading reason for increased incidence over the same nine-month period in 1956.

Of the 151,325 cases paid for all subscribers during the first nine months of 1957, 25,679 required care for accidental injuries.

Although leading in number of cases paid, accidents ranked seventh in dollar cost. Approximately \$1,400,000 in hospital benefits have been provided for accidental injury of Blue Cross subscribers.

During this same nine-month period (January through September) 24,112 Blue Cross subscribers were admitted to hospitals for conditions of pregnancy. Benefits provided for this category exceeded \$3,000,000. Conditions of pregnancy cases amounted to 15.9 per cent of Blue Cross cases paid, or the second largest reason for increased Blue Cross incidence.

The third ranking reason for hospitalization of Blue Cross subscribers was respiratory illness. 20,174 cases, or 13.3 per cent of Blue Cross cases paid for the first nine months of 1957, were for this reason. Benefits paid for respiratory conditions amounted to approximately \$1,950,000.

Ranking fourth in the reasons for hospitalization of Blue Cross subscribers was digestive illnesses. Blue Cross benefits during the first nine months of 1957 in this category approximated \$3,600,000. Although ranking fourth in frequency of occurrence, digestive diseases outrank all other categories in benefits paid.

A contributing reason for this high-benefits-paid figure is the fact that digestive diseases require a longer period of care than any other three leading causes of hospitalization. Digestive illness required an average of 7.2 days per case, compared to 3.1 days for accidents, 4.7 days per case for conditions of pregnancy, and 4.4 days per case for respiratory illness.

As of September 30, 1957, there were 427,359 Blue Cross contracts in effect representing 1,127,678 Minnesotans.

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Book Reviews

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

TRAITÉ DE TECHNIQUE CHIRURGICALE. By B. Fey, P. Mocquet, S. Oberlin, and others. Second ed. Vol. 5—Organes génitaux de la femme, Césariennes, Mamelle. 780 pages. Illus. Price 300 fr. Paris: Masson et Cie, 1956.

This volume of surgical technique, which is one of a series, is concerned with the female genital organs. The book is well written and fairly complete. The illustrations are good. As with many volumes like this, some of the procedures are obsolete and others are not too critically reviewed. All in all, though, it is a fairly good review. The index is adequate.

C. E. R.

TUBERCULOSIS: EVERY PHYSICIAN'S PROBLEM.

By J. Arthur Myers, Professor of Internal Medicine and Public Health, Medical and Graduate Schools, University of Minnesota. 290 pages. Illus. Price \$7.50. Springfield, Ill.: Charles C Thomas, ©1957.

Chemotherapy may have postponed deaths from tuberculosis, thus decreasing the mortality rates, but it has not

eradicated the problem of the disease; and, in fact, chemotherapy may lull us into a feeling of false security.

Dr. Myers has summed up for the physician and the public health worker the problem of tuberculosis—from his brief historical sketch in the first chapter to a summary of the role of the physician, in the final chapter. Feeling "that ultimately eradication of tubercle bacillus is dependent upon adequate diagnosis, proper treatment and preventive measures directed by physicians and their allies," he has set forth in readable style a concise description of the tubercle bacillus and how it invades the human body, of the diagnostic procedures and treatment employed today in each clinical type of the disease, and of the methods known and used for prevention and control.

An interesting chapter is on "Anachronisms," which, in this book, are "theories and opinions which have long been in use but have proved of no value or are even harmful."

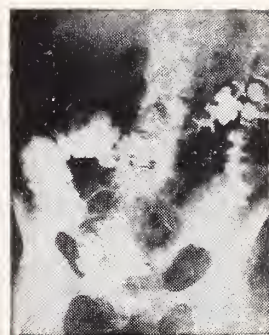
It is due in large part to Dr. J. Arthur Myers that Minnesota is one of the leaders in the fight against tuberculosis, and in this book he draws, of course, from his experiences and cites methods used in this state.

This will serve well as a handbook on the problems of tuberculosis; and for those who wish to pursue some phase further, the author has included references at the end of each chapter.

M.M.P.

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